MINUTES OF THE 44TH MEETING OF THE EXPERT APPRAISAL COMMITTEE FOR RIVER VALLEY AND HYDROELECTRIC PROJECTS HELD ON 27TH – 28TH MARCH, 2023 FROM 10:30 AM – 05.30 PM THROUGH VIDEO CONFERENCE.

The 44th meeting of the re-constituted EAC for River Valley & Hydroelectric Projects organized by the Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi, was held on 27th -28th March, 2023 through video conference. Dr. A. K. Malhotra, Expert Member chaired the meeting session on 27th March, 2023 in the absence of Dr. K. Gopakumar who chaired the session on 28th March, 2023. The list of Members present in the meeting is at **Annexure**.

Agenda Item No. 44.1: Confirmation of Minutes of 43rd EAC meeting held on 7.03.2023

The Member Secretary, EAC informed that the proposal for grant of TOR for conducting EIA study for proposed construction of Sirkari-Bhyol Rupsiabagar Hydro Electric Project of 168 MW as Run of River scheme in an area of 30 ha in Tehsil Munsiyari, Pithoragarh District (Uttarakhand) by M/s UJVN LTD was considered by the EAC in its 7th held on 25.02.2021, 10th meeting held on 15.04.2021 and 33rd meeting held on 29.08.2022 wherein the capacity of the project has been mentioned as 168 MW but it was noted that project proponent has obtained Amendment in Terms of reference vide letter dated 13th October, 2020 for change in capacity from 168 MW to 120 MW. Accordingly, capacity mentioned for the project may be read as 120 MW instead of 168 MW.

The EAC after verifying the information from the records available agreed for making necessary corrections in the Minutes of the EAC meetings held on 25.02.2021, 15.04.2021 and 29.08.2022 w.r.t. power generation capacity of the project.

The EAC confirmed the minutes of 43rd EAC meeting held on 07th March, 2023 with above modification/corrigendum in the minutes of EAC meetings held on 25.02.2021, 15.04.2021 and 29.08.2022.

Agenda Item No. 44.2

Sonbhadra Off-Stream Closed Loop Pumped Storage Project (1200 MW) in an area of 453.11 Ha located at Village Bahera, Tehsil Robertsganj, District Sonbhadra (Uttar Pradesh) by M/s Sri Siddharth Infratech & Services (I) Private Limited– Terms of Reference (TOR) - reg.

[Proposal No. IA/UP/RIV/420888/2023; F. No. J-12011/15/2023-IA.I (R)]

44.2.1: The proposal is for grant of Terms of Reference (TOR) for Sonbhadra Off-Stream Closed Loop Pumped Storage Project (1200 MW) in an area of 453.11 Ha located at Village Bahera, Tehsil Robertsganj, District Sonbhadra (Uttar Pradesh) by M/s Sri Siddharth Infratech & Services (I) Private Limited.

44.2.2: The details of the project submitted by project proponent and ascertained from the document submitted are mentioned below:

i. M/s Sri Siddharth Infratech & Services (I) Pvt. Ltd proposes to develop Off Stream Closed Loop Pumped Storage Project (OCPSP) located in Bahera Village of Robertsganj Tehsil in Sonbhadra District, Uttar Pradesh.

ii. Sonbhadra Pumped Storage Project envisaged as Off-Stream Closed Loop Pumped Storage Project (OCPSP) of 1200 MW / 7236 MWH storage capacity, located in Bahera Village of Robertsganj Tehsil in Sonbhadra District, Uttar Pradesh.

iii. The geographical co-ordinates of the proposed upper reservoir are at latitude 24°33'9.59" N North and longitude is 83°11'6.36" E East and that of lower reservoir are at latitude 24°34'7.67" N North and longitude 83°9'57.29" E East.

iv. The lower reservoir is proposed to be located in the flat / gradually sloping land which is suitable for creating the desired gross storage capacity 0.511 TMC by doing excavation up to the desired level. Out of 0.511 TMC, the live storage capacity is 0.504 TMC and dead storage capacity is 0.007 TMC by keeping FRL and MDDL at EL 330.00m & EL 312.00m, respectively. For creating this storage, it is proposed to construct rockfill embankment for the weighted average height of 17m (with maximum height of 23m) for the length of 2072 m.

v. It is proposed that One-time requirement of 0.629 TMC of water will be lifted either from existing nearby Dhandharoul Dam (which is located about 4 Km away from the proposed lower reservoir) or from Son river (which is located about 10 km away from the proposed upper reservoir) and will be stored in the upper reservoir to be constructed and used cyclically for energy storage and discharge. Evaporation losses of 0.08 TMC of water will be recouped periodically either from Dhandharoul Dam or from Son river based on the requirement. This Project envisages non-consumptive re-utilization of 0.504 TMC of water for recirculation among two proposed reservoirs.

vi. It is proposed that One-time requirement of 0.629 TMC of water will be lifted either from existing nearby Dhandharoul Dam (which is located about 4 Km away from the proposed lower reservoir) or from Son river (which is located about 10 km away from the proposed upper reservoir) and will be stored in the upper reservoir to be constructed and used cyclically for energy storage and discharge.

vii. The Sonbhadra Off-Stream Closed Loop Pumped Storage Project envisages construction of:

- Rock fill embankments of weighted average height of around 20m with maximum of 43m height in upper reservoir and weighted average height of around 17 m with maximum of 23m in lower reservoir for creation of Sonbhadra upper & lower reservoir with 0.509 & 0.504 TMC live storage capacity respectively.
- 40.15 m high Power Intake Structure. 3 no. of 1100.58 m long and 6.50m dia. circular steel lined Penstock / Pressure Shaft (i.e., consisting of 51.14m long Intake Tunnel, 656.34m long surface penstock, 209.10m long vertical pressure shaft and 184.00 m long Horizontal pressure shaft up to powerhouse) to feed 3 nos. 300MW unit each. Similarly, another one no. of 1000.58 m long 6.50m dia. circular steel lined Penstock / Pressure Shaft (i.e., consisting of 51.14 m long Intake Tunnel, 656.34 m long surface penstock, 209.10 m long vertical pressure shaft and 84.00 m long Horizontal pressure shaft up to bifurcation point) which will get bifurcated into 2 nos. near powerhouse each of 100m long and 4.50m dia. to feed 2 nos. of 150 MW unit each.
- A surface Powerhouse having an installation of Three reversible Francis turbine of 300 MW capacity (Fixed speed turbine) and two reversible Francis turbine each of 150MW (Fixed speed turbine) operating under a rated head of 209 m in generating mode and 220.00 m in pumping mode.
- 40 wide and FSD of 5.0m Tail race channel of 457 m long joining with the proposed lower reservoir.

viii. The sailent features of the project are as under: -

Project details:

Name of the Proposal	Sri Siddharth Infratech & Services (I) Pvt. Ltd. Sonbhadra Off-Stream Closed Loop Pumped Storage Project at Uttar Pradesh.
Location (Including coordinates)	The proposed project involves creation Upper Reservoir 24°33'9.59" N, 83°11'6.36" E Lower Reservoir 24°34'7.67" N, 83° 9'57.29" E
Inter- state issue involved	No
Seismic zone	Zone -II (least active)

Category details:

Category of the project	1(c) River Valley Projects
Provisions	
Capacity / Cultural command area (CCA)	1200 MW
Attracts the General Conditions (Yes/No)	Yes
Additional information (if any)	Nil

Electricity generation capacity:

Powerhouse Installed Capacity	1200 MW (7236 MWH)
Generation of Electricity Annually	2508 MU
No. of Units	5 Nos. (3 X 300 MW) + (2 X 150 MW)
Additional information (if any)	Nil

ToR/EC Details:

Cost of project	7576.62 Cr.
Total area of Project	453.11 Ha
Height of Dam from River Bed (EL)	Height of Embankment max- 43m & Avg-20 m
Length of Tunnel/Channel	51.14 m
Details of Submergence area	271.88 Ha
Types of Waste and quantity of generation during construction/ Operation	Muck from excavation, solid waste from labour colony and construction waste
E-Flows for the Project	Not Applicable, as this is Off-Stream Closed Loop Pumped Storage Project (OCPSP)

Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin. If not the E-Flows maintain criteria for sustaining river ecosystem.	No

Muck Management Details:

No. of proposed disposal area/ (type of land-Forest/Pvt. land)	Two Locations of total 40 Ha in Non-Forest Area
Muck Management Plan	Will be Provided in EIA/EMP report
Monitoring mechanism for Muck Disposal	Will be Provided in EIA/EMP report

Land Area Breakup:

Government land/Forest Land	Forest Land- 315.74 Ha
Submergence area/Reservoir area	271.88 Ha-Upper & Lower reservoirs
Land required for project components	453.11 Ha- Total Land requirement
Additional information (if any)	137.37 Ha-Non-Forest Land

Presence of Environmentally Sensitive areas in the study area

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/No**	**Detailsof Certificate / letter/ Remarks**
Reserve Forest/Protected Forest Land	--	Distance from nearest protected area (Kaimur WLS) is 1.8 Km, however, proposed project is outside the notified ESZ boundary of the sanctuary.
National Park	--	
Wildlife Sanctuary	---	

Court case details:

Court Case	Nil
Additional information (if any)	Nil

Previous EC compliance and necessary approvals:

Particulars	Letter no. and date
Certified EC compliance report (if applicable)	Not Applicable
Status of Stage- I FC	Yet to Apply
Additional detail (If any)	Nil
Is FRA (2006) done for FC-I	Yet to Apply

Miscellaneous

Particulars	Details
Details of consultant	M/s. R S Envirolink Technologies Pvt. Ltd. (RSET) (NABET Accredited Consultant Organization) Certificate No: NABET/EIA/2225/RA0274 Validity: August 15, 2025
Project Benefits	• Pumped storage hydropower is a modified use of conventional hydropower technology to store and manage energy or electricity by moving water between an upper and lower reservoir. Currently, pumped storage round-trip or cycle energy efficiencies exceed 80%, comparing favorably to other energy storage technologies and thermal technologies. This effectively shifts, stores, and reuses energy generated until there is corresponding demand for system reserves and variable energy integration. This shifting can also occur to avoid transmission congestion periods, to help more efficiently manage transmission grid, and to avoid potential interruptions to energy supply. This is important because many of the renewable energy resources being developed (e.g., wind and solar) are generated at times of low demand and off-peak energy demand periods are still being met with fossil fuel resources, often at inefficient performance levels that increase the release of greenhouse gas emissions. • Further, pumped storage projects are critical to the national economy and overall energy reliability because it's: • Least expensive source of electricity,

	not requiring fossil fuel for generation • An emission-free renewable source • Balancing grid for demand driven variations • Balancing generation driven variations • Voltage support and grid stability • Apart from this, proposed PSP will also benefit the local community by creating employment opportunities and will result in upliftment of livelihood and socio-economic conditions.
Status of other statutory clearances	Forest Clearance: Online application seeking forest diversion for 315.74 Ha after receipt of ToR Approval. Alongside, other statutory clearances (as applicable) from State as well as Central government will be obtained post completion of Detailed Project Report.
R&R details	Details shall be evaluated during EIA/EMP Studies
Additional detail (If any)	Nil

ix. **Alternate Layouts:**

Three alternative layouts for this scheme were studied.

Alternative – 1: Layout with Surface Powerhouse and other components of this scheme are Site – 1 Upper reservoir, Approach Channel, Intake structure, Penstock / Pressure Shaft, Tail Race Outlet, Tail Race Channel and Site-1 Lower reservoir.

Alternative – 2: Layout with Surface Powerhouse and other components of this scheme are Site – 2 Upper reservoir, Approach Channel, Intake structure, Penstock / Pressure Shaft, Surge Shaft, Tail Race Tunnel, Tail Race Outlet, Tail Race Channel and Site – 2 Lower reservoir.

Alternative – 3: Layout with Surface Powerhouse and other components of this scheme are Site – 2 Upper reservoir, Approach Channel, Intake structure, Penstock / Pressure Shaft, Surge Shaft, Tail Race Outlet, Tail Race Channel and Site – 1 Lower reservoir.

Selection of Final Layout:

As discussed above, Alternative – 1 layout has been preferred considering the following reasons:

- The length of embankment of upper reservoir for Alternative -1 (i.e., 2205 m) is less than Alternative – 2 & 3 (i.e., 2480 m). Hence, cost and time can be reduced to some extent for Alternative – 1 layout.
- The length of Penstock for Alternative -1 (i.e., 1100.58 m) is less than Alternative – 2(i.e., 2079 m) and Alternative – 3 (i.e., 2005m) which will increase Penstock cost substantially. In addition, since the length of water conductor system is more and L/H ratio is also more than 6 in Alternative – 2 & 3, Surge shaft structure is required to be provided as an additional structure which will increase overall project cost further considerably.
- The total area of land required in Alternative – 2 & 3 are more than Alternative – 1.

- The forest land area required in Alternative – 2 & 3 are more than Alternative – 1.

44.2.3 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of terms of reference to the project for Sonbhadra Off-Stream Closed Loop Pumped Storage Project (1200 MW) in an area of 453.11 Ha located at Village Bahera, Tehsil Robertsganj, District Sonbhadra (Uttar Pradesh) by M/s Sri Siddharth Infratech & Services (I) Private Limited.

The project/activity is covered under Category A of item 1 (c) 'River Valley projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.

44.2.4 The EAC after detailed deliberation on the information submitted and as presented during the meeting ***recommended*** for grant of Standard ToR for conducting EIA study for Sonbhadra Off-Stream Closed Loop Pumped Storage Project (1200 MW) in an area of 453.11 Ha located at Village Bahera, Tehsil Robertsganj, District Sonbhadra (Uttar Pradesh) by M/s Sri Siddharth Infratech & Services (I) Private Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

[A] Environmental Management and Biodiversity Conservation:

i. Cumulative Impact of project on carrying capacity and sustainability of Reservoir/ nalahs of catchment area / due to tapping of water for filling reservoir.
ii. Alternate location for pump house shall be explored as proposed location is in close proximity of ESZ of Kaimur WLS.
iii. Alternative sites for various components shall be identified in terms of loss of forest area.
iv. Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Standard ToR shall be collected for preparation of EIA/ EMP report along with soil characteristics which shall be studied at minimum 10 locations. The ground water level at 10 locations shall be measured in project area in all three seasons.
v. A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted for power generation and thermal stratification. Accordingly, Environment Management plan shall be prepared.
vi. Sampling locations be located to cover villages situated near the reservoir and around boundary of forest area for collection of baseline data and data to be incorporated in EIA/ EMP report.
vii. Identify the sand mining/ quarrying sites in submergence area and downstream of reservoir.
viii. Source of construction material and its distance from the project site along with detailed transportation plan for construction material.
ix. A detailed reclamation/ restoration plan of quarrying site/sites be incorporated in the EIA/EMP report.
x. Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is located outside the Eco Sensitive Zone (ESZ) of Kaimur wildlife sanctuary.
xi. A detailed wildlife conservation plan for Schedule –I species be prepared duly approved by the Chief Wild Life Warden be submitted.

xii. In case any Wildlife Corridor is located within 10 km radius of the project site a detailed study shall be conducted to assess the impact of project on safe movement of wild animals.
xiii. Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.
xiv. Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Govt. institutions/ Indian Council of Agriculture Research (ICAR)and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.
xv. MoU for water uses for the project shall be signed and approved by concerned authority.
xvi. Environmental matrix during construction and operational phase needs to be submitted.
xvii. Matrix formulated on the basis of detailed study and field survey of flora and Fauna methodology used shall be mentioned in the EIA report.
xviii. Endemic plant and animal species found in the area concerned shall be provided instead listing entire endemic species found in the State.
xix. Details of Flora and Fauna reported in submergence area, Nos. of tree along with their density and nomenclature of the tree species required to be felled for reservoir creation and other project component.
xx. Project impact on avi-fauna shall be studied and incorporated in EIA/ EMP report.
xxi. Impact assessment on the fish diversity based on the hydrological alteration at the water drawing sources shall be studied.
xxii. Stage-I Forest Clearance shall be obtained.
xxiii. Study of impacts of project on water sources i.e. Dhandharoul Dam/ Son river.

[B] Socio-economic Study

xxiv. Declaration by the project proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.
xxv. All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/ EMP report in the relevant chapter.
xxvi. Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F.No.22- 65/2017- IA.III dated 30th September, 2020 shall be submitted.
xxvii. Tentative no. of project affected families shall be identified and accordingly appropriate Rehabilitation & Resettlement plan shall be prepared.
xxviii. Details of settlement in 10 km area shall be submitted.

[C] Muck Management/ Disaster Management

xxix. Details of quantity of muck generation component wise and disposal site along with transportation plan and its monitoring to be provided.
xxx. Details of Muck Management plan prepared along with estimated cost incorporated in EIA/ EMP report.
xxxi. Techno-economic viability of the project must be recommended from CEA/ CWC

[D] Miscellaneous.

xxxii. Pre-DPR Chapters viz. Layout Map and Power Potential Studies duly approved by CWC/CEA shall be submitted.
xxxiii. Undertaking need to submitted on affidavit that regarding no activities has been yet started on the project site and water allocated to this scheme shall not be diverted to other purpose.
xxxiv. Both capital and recurring expenditure under EMP shall be submitted.

xxxv. The photograph should bear the date, time, latitude & longitude of the monitoring station/ sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyse the samples.

xxxvi. Arial view video of project site shall be recorded and to be submitted.

xxxvii. Detailed plan to restore wider roads and convert them into narrow upto 10m after construction of the project.

Agenda Item No. 44.3

Greenko TN-01Off-Stream Closed Loop Pumped Storage Project (1200 MW) in an area of 547.22 Ha located at village Tirumalaikuppam, Taluk Ambur, District Tirupathur (Tamil Nadu) by M/s Greenko Energies Private Limited – Terms of Reference (TOR) - reg.

[Proposal No. IA/TN/RIV/421434/2023; F. No. J-12011/16/2023-IA.I (R)]

44.3.1: The proposal is for grant of Terms of Reference (TOR) for Greenko TN-01Off-Stream Closed Loop Pumped Storage Project (1200 MW) in an area of 547.22 Ha located at village Tirumalaikuppam, Taluk Ambur, District Tirupathur (Tamil Nadu) by M/s Greenko Energies Private Limited.

44.3.2: The details of the project submitted by project proponent and ascertained from the document submitted are mentioned below:

i. M/s Greenko Energies Pvt. Ltd., proposes to develop Greenko TN-01 Pumped Storage Project (PSP) near located at Palur & Tirumalaikuppam villages of Ambur (T), Tirupathur (D) in the state of Tamil Nadu.

ii. Greenko TN-01 Pumped Storage Project envisaged as Off-Stream Closed Loop Pumped Storage project (OCPSP) of 1200 MW / 7236 MWH storage capacity. The geographical coordinates of the proposed upper reservoir are at longitude 78°50'08.29" E and latitude is 12°49'56.18" N and that of lower reservoir are at longitude 78°51'20.87" E and latitude 12°50'15.87" N. Proposed rating of Pumped Storage Project is 1200 MW.

iii. The Greenko TN-01 OCPSP will comprise of two reservoirs which are to be constructed newly. The upper reservoir is proposed to be located on natural depression which is suitable for creating the desired gross storage capacity of 0.802 TMC by doing excavation up to the desired level. Out of 0.802 TMC, the live storage capacity is 0.624 TMC and the dead storage capacity is 0.177 TMC by keeping FRL & MDDL at EL 520.00m & EL 496.00m respectively. For creating this storage, it is proposed to construct rockfill embankment for the weighted average height of around 31m (with maximum height of 58m) for the length of 1556 m.

iv. The lower reservoir is proposed to be located on flat / gradually sloping ground which is suitable for creating the desired gross storage capacity of 0.656 TMC by doing excavation up to the desired level. Out of 0.656 TMC, the live storage capacity is 0.622 TMC and dead storage capacity is 0.03 TMC by keeping FRL and MDDL at EL 340.00m & EL 327.00m respectively. For creating this storage, it is proposed to construct Rockfill embankment for the weighted average height of 17m (with maximum height of 23m) for the length of 2537 m.

v. It is proposed that One-time requirement of 0.833 TMC of water will be lifted from existing nearby Palar River (which is located about 4 Km away from the proposed Lower reservoir) and will be stored in the lower reservoir to be constructed and used cyclically for energy storage and discharge. Evaporation losses will be recouped periodically from Palar River.

vi. The Greenko TN-01 Off-Stream Closed Loop Pumped Storage Project envisages construction of

- Rock fill embankments of weighted average height of around 31m with maximum of 58m height in upper reservoir and weighted average height of around 17m with maximum of 23m in lower reservoir for creation of Greenko TN-01 upper & lower reservoir with 0.624 TMC & 0.622 TMC live storage capacity respectively.
- 45.15 m high Power Intake Structure.
- 3 nos. each of 883.97 m long and 7.5 m dia. circular steel lined Penstock / Pressure Shaft (i.e., consisting of 232.72 m long Surface Penstock, 227.85 m long vertical pressure shaft, 423.97 m long Horizontal pressure shaft) to feed 3 units of 300MW each.
- Similarly, 1 no. of 783.97 m long and 7.5 m dia. circular steel lined Penstock / Pressure Shaft (i.e., consisting of 232.72 m long Surface Penstock, 227.85 m long vertical pressure shaft, 323.97 m long Horizontal pressure shaft up to bifurcation point) which will get bifurcated into two nos. of 5.25m dia. of about 100m long to feed 2 units of 150MW each.
- A surface Powerhouse having an installation of three reversible Francis' turbine of 300 MW capacity (Fixed speed turbine) and two reversible Francis turbine each of 150MW (both are Fixed speed turbines) operating under a rated head of 169.50 m in generating mode and 180.50 m in pumping mode.
- 5 nos. of Tail Race Tunnel each of 172.98 m long (Three nos. of 8.00 m dia. For larger unit and two nos. of 5.75m dia. for smaller units).
- 60m wide and FSD of 5.0m Tail Race Channel of 758 m long joining with the proposed lower reservoir.

vii. The sailent features of the project are as under: -

Project details:

Name of the Proposal	Greenko Energies Private Limited Greenko TN01 Off-Stream Closed Loop Pumped Storage Project – Tamil Nadu
Location (Including coordinates)	The proposed project involves creation Upper Reservoir 12°49'56.18" N & 78°50'08.29" E Lower Reservoir 12°50'15.87" N & 78°51'20.87" E
Inter- state issue involved	No
Seismic zone	Zone -II

Category details:

Category of the project	1(c) River Valley Projects
Provisions	
Capacity / Cultural command area (CCA)	1200 MW
Attracts the General Conditions (Yes/No)	No

Additional information (if any)	Nil

Electricity generation capacity:

Powerhouse Installed Capacity	1200 MW (7236 MWH)
Generation of Electricity Annually	2511 MU
No. of Units	5 Nos. (3 X 300 MW) + (2 X 150 MW)
Additional information (if any)	Nil

ToR/EC Details:

Cost of project	7622.43 Cr.
Total area of Project	547.22 Ha
Height of Dam from River Bed (EL)	UR with rockfill embankment for the weighted average height of around 31m (with maximum height of 58m) and LR with rockfill embankment for the weighted average height of 17m (with maximum height of 23m)
Length of Tunnel/Channel	173 m
Details of Submergence area	422.74 Ha
Types of Waste and quantity of generation during construction/ Operation	Muck from excavation, solid waste from labour colony and construction waste
E-Flows for the Project	Not Applicable, as this is Off-Stream Closed Loop Pumped Storage Project (OCPSP)
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then: E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin. If not the E-Flows maintain criteria for sustaining river ecosystem.	No

Muck Management Details:

No. of proposed disposal area/ (type of land-Forest/Pvt. land)	One Location of 40 Ha in Non-Forest Area
Muck Management Plan	Will be Provided in EIA/EMP report
Monitoring mechanism for Muck Disposal	Will be Provided in EIA/EMP report

Land Area Breakup:

Government land/Forest Land	Forest Land- 453.92 Ha
Submergence area/Reservoir area	422.74 Ha-Upper & Lower reservoirs
Land required for project components	547.22 Ha- Total Land requirement
Additional information (if any)	93.30 Ha-Non-Forest Land

Presence of Environmentally Sensitive areas in the study area

Forest Land/ Protected Area/ Environmental Sensitivity Zone	Yes/No	Details of Certificate / letter/ Remarks
Reserve Forest/Protected Forest Land	--	Nil
National Park	--	
Wildlife Sanctuary	--	

Court case details:

Court Case	Nil
Additional information (if any)	Nil

Affidavit/Undertaking details:

Affidavit/Undertaking	Enclosed
Additional information (if any)	Nil

Previous EC compliance and necessary approvals:

Particulars	Letter no. and date
Certified EC compliance report (if applicable)	Not Applicable
Status of Stage- I FC	Yet to Apply
Additional detail (If any)	Nil
Is FRA (2006) done for FC-I	Yet to Apply

Miscellaneous

Particulars	Details
Details of consultant	M/s. R S Envirolink Technologies Pvt. Ltd. (RSET) (*NABET* Accredited *Consultant Organization*) Certificate No : NABET/EIA/2225/RA0274 Validity : August 15, 2025
Project Benefits	• Pumped storage hydropower is a modified use of conventional hydropower technology to store and manage energy or electricity by moving water between an upper and lower reservoir. Currently, pumped storage round-trip or cycle energy efficiencies exceed 80%, comparing favorably to other energy storage technologies and thermal technologies. This

	effectively shifts, stores, and reuses energy generated until there is corresponding demand for system reserves and variable energy integration. This shifting can also occur to avoid transmission congestion periods, to help more efficiently manage transmission grid, and to avoid potential interruptions to energy supply. This is important because many of the renewable energy resources being developed (e.g., wind and solar) are generated at times of low demand and off-peak energy demand periods are still being met with fossil fuel resources, often at inefficient performance levels that increase the release of greenhouse gas emissions. • Further, pumped storage projects are critical to the national economy and overall energy reliability because it's: o Least expensive source of electricity, not requiring fossil fuel for generation o An emission-free renewable source o Balancing grid for demand driven variations o Balancing generation driven variations o Voltage support and grid stability • Apart from this, proposed PSP will also benefit the local community by creating employment opportunities and will result in upliftment of livelihood and socio-economic conditions.
Status of other statutory clearances	**Forest Clearance:** Online application seeking forest diversion for around 453.92 Ha after receipt of ToR Approval. Alongside, other statutory clearances (as applicable) from State as well as Central government will be obtained post completion of Detailed Project Report.
R&R details	Details shall be evaluated during EIA/EMP Studies
Additional detail (If any)	Nil

viii. Alternate Layouts: Three alternative layouts for this scheme were studied.

Alternative – 1: Layout with Surface Powerhouse and other components of this scheme are Site – 1 Upper reservoir, Intake structure, Penstock / Pressure Shaft, Tail Race Tunnel, Tail Race Outlet, Tail Race Channel and Site-1 Lower reservoir.

Alternative – 2: Layout with Surface Powerhouse and other components of this scheme are Site – 2 Upper reservoir, Intake structure, Penstock / Pressure Shaft, Surge Shaft, Tail Race Tunnel, Tail Race Outlet, Tail Race Channel and Site – 2 Lower reservoir.

Alternative – 3: Layout with Surface Powerhouse and other components of this scheme are Site – 2 Upper reservoir, Intake structure, Penstock / Pressure Shaft, Surge Shaft, Tail Race Tunnel, Tail Race Outlet, Tail Race Channel and Site – 1 Lower reservoir.

Selection of Final Layout

Alternative – 1 layout has been preferred considering the following reasons:

- The length of embankment of upper reservoir for Alternative -1 (i.e., 1556 m) is more than Alternative – 2 (i.e., 1190 m). However, the maximum height of embankment of upper reservoir for Alternative – 1 is 58 m only whereas in case of Alternative – 2 it is 128m which has to be constructed for about 500m long (i.e., almost 50% of total length of embankment). Also, the Considering the FRL and MDDL of reservoir, the dead storage capacity requirement is less in case of Alternative – 1 whereas in case of Alternative – 2 it is much more than the live storage capacity. Therefore, considering the maximum height of embankment and dead storage capacity requirement, considerable cost and time can be reduced for Alternative – 1 layout.
- The length of embankment of lower reservoir for Alternative – 1 (i.e., 2537m) is less than Alternative – 2 (i.e., 4008m). Hence, considerable cost and time will be reduced in Alternative – 1 layout.
- The length of Penstock for Alternative – 1 is (i.e., 883.97 m) less than Alternative – 2 (i.e., 2436m) and Alternative – 3 (i.e., 1925m). Hence, considerable time and cost will be reduced in Alternative – 1 layout.
- No surge shaft is required for Alternative – 1. But for Alternative – 2 & 3, Surge shaft is required to be provided because of more length of penstock and the L/H ratio is more than 6. Because of non-requirement of additional structure, considerable cost
- and time will be reduced for Alternative – 1 layout.
- The length of Tail Race Channel for Alternative -1 (i.e., 758m) is less than Alternative2 (i.e., 943m). Therefore, cost and time will get reduced to some extent for Alternative – 1 layout.
- In Alternative – 2, the land area required for lower reservoir is partly in forest land and partly in private land. Because of this reason, the forest land area requirement in Alternative – 2 (i.e., 432.87 Ha) is less than Alternative – 1 (i.e., 453.92 Ha). Since, he lower reservoir is encroaching the habitation, cultivation and industrial area, and the existing roads connecting few nearby villages and the reservoir is very close to Ramanayanikuppam Village, Keeping the reservoir in this location will cause disturbance and dislocation of large number of populations and industries and realignment of roads which will create social and environmental issues. Therefore, Alternative – 2 layout is not considered and no Social and Environmental issues are envisaged in case of Alternative – 1 layout.
- The total area of land required for Alternative – 1 (i.e., 547.22 Ha) is less than Alternative – 2 (i.e., 655.45 Ha) and Alternative – 3 (581.37 Ha).
- The forest land area required for Alternative – 1 (i.e., 453.92 Ha) is less than Alternative – 3 (i.e., 488.08 Ha).

44.3.3 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of terms of reference to the project for Greenko TN-01Off-Stream Closed Loop Pumped Storage Project (1200 MW) in an area of 547.22 Ha located at village Tirumalaikuppam, Taluk Ambur, District Tirupathur (Tamil Nadu) by M/s Greenko Energies Private Limited.

The project/activity is covered under Category A of item 1 (c) 'River Valley projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.

44.3.4 The EAC after detailed deliberation on the information submitted and as presented during the meeting ***recommended*** for grant of Standard ToR for conducting EIA study for Greenko TN-01Off-Stream Closed Loop Pumped Storage Project (1200 MW) in an area of 547.22 Ha located at village Tirumalaikuppam, Taluk Ambur, District Tirupathur (Tamil Nadu) by M/s Greenko Energies Private Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

[A] Environmental Management and Biodiversity Conservation:

i. Cumulative Impact of project on carrying capacity and sustainability of Reservoir/ nalahs of catchment area / due to tapping of water for filling reservoir.
ii. Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Standard ToR shall be collected for preparation of EIA/ EMP report along with soil characteristics which shall be studied at minimum 10 locations. The ground water level at 10 locations shall be measured in project area in all three seasons.
iii. A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted for power generation and thermal stratification. Accordingly, Environment Management plan shall be prepared.
iv. Sampling locations be located to cover villages situated near the reservoir and around boundary of forest area for collection of baseline data and data to be incorporated in EIA/ EMP report.
v. Identify the sand mining/ quarrying sites in submergence area and downstream of reservoir.
vi. Source of construction material and its distance from the project site along with detailed transportation plan for construction material.
vii. A detailed reclamation/ restoration plan of quarrying site/sites be incorporated in the EIA/EMP report.
viii. Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is located outside the Eco Sensitive Zone (ESZ).
ix. A detailed wildlife conservation plan for Schedule –I species be prepared duly approved by the Chief Wild Life Warden be submitted.
x. In case any Wildlife Corridor is located within 10 km radius of the project site a detailed study shall be conducted to assess the impact of project on safe movement of wild animals.
xi. Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.
xii. Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Govt. institutions/ Indian Council of Agriculture Research (ICAR)and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.
xiii. MoU for water uses for the project shall be signed and approved by concerned authority.
xiv. Environmental matrix during construction and operational phase needs to be submitted.
xv. Matrix formulated on the basis of detailed study and field survey of flora and Fauna methodology used shall be mentioned in the EIA report.
xvi. Endemic plant and animal species found in the area concerned shall be provided instead listing entire endemic species found in the State.

xvii. Details of Flora and Fauna reported in submergence area, Nos. of tree along with their density and nomenclature of the tree species required to be felled for reservoir creation and other project component.
xviii. Project impact on avi-fauna shall be studied and incorporated in EIA/ EMP report.
xix. Impact assessment on the fish diversity based on the hydrological alteration at the water drawing sources shall be studied.
xx. Stage-I Forest Clearance shall be obtained.
xxi. Study of impacts of project on water sources i.e. Palar River.

[B] Socio-economic Study

xxii. Declaration by the project proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.
xxiii. All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/ EMP report in the relevant chapter.
xxiv. Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F.No.22- 65/2017- IA.III dated 30th September, 2020 shall be submitted.
xxv. Tentative no. of project affected families shall be identified and accordingly appropriate Rehabilitation & Resettlement plan shall be prepared.
xxvi. Details of settlement in 10 km area shall be submitted.

[C] Muck Management/ Disaster Management

xxvii. Details of quantity of muck generation component wise and disposal site along with transportation plan and its monitoring to be provided.
xxviii. Details of Muck Management plan prepared along with estimated cost incorporated in EIA/ EMP report.
xxix. Techno-economic viability of the project must be recommended from CEA/ CWC

[D] Miscellaneous.

xxx. Pre-DPR Chapters viz. Layout Map and Power Potential Studies duly approved by CWC/CEA shall be submitted.
xxxi. Undertaking need to submitted on affidavit that regarding no activities has been yet started on the project site and water allocated to this scheme shall not be diverted to other purpose.
xxxii. Both capital and recurring expenditure under EMP shall be submitted.
xxxiii. The photograph should bear the date, time, latitude & longitude of the monitoring station/ sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyse the samples.
xxxiv. Arial view video of project site shall be recorded and to be submitted.
xxxv. Detailed plan to restore wider roads and convert them into narrow upto 10m after construction of the project.

Agenda Item No. 44.4

Cerulean-II Off-Stream Closed Loop Pumped Storage project (640 MW) in an area of 444.78 Ha located at village Regulguda, Manikapatar & Sarkepally, Tehsil Wankidi & Kagaznagar, Disttrict Komaram Bheem (Telangana) by M/s Cerulean Energy Solutions Private Limited - Terms of Reference (TOR) - reg.

44.4.1: The proposal is for grant of Terms of Reference (TOR) for Cerulean-II Off-Stream Closed Loop Pumped Storage project (640 MW) in an area of 444.78 Ha located at village Regulguda, Manikapatar & Sarkepally, Tehsil Wankidi & Kagaznagar, Disttrict Komaram Bheem (Telangana) by M/s Cerulean Energy Solutions Private Limited.

44.4.2: The details of the project submitted by project proponent and ascertained from the document submitted are mentioned below:

i. M/s Sri Siddharth Infratech & Services (I) Pvt. Ltd proposes to develop Cerulean-II Off-Stream Closed Loop Pumped Storage Project (OCPSP) (640 MW/ 3955MWH) near located near Regulguda, Manikapatar & Sarkepally (V) of Wankidi & Kagaznagar (T) in Komaram Bheem (D) in the state of Telangana.

ii. The geographical co-ordinates of the proposed upper reservoir are at longitude 79°26'29.79" E and latitude is 19°26'33.53" N and that of lower reservoir are at longitude 79°27'32.08" E and latitude 19°26'17.74" N. Proposed rating of Pumped Storage Project is 640 MW.

iii. The Cerulean-II OCPSP will comprise of two reservoirs which are to be constructed newly. The upper reservoir is proposed to be located on flat / gradually sloping land which is suitable for creating the desired gross storage capacity of 0.351 TMC. Out of 0.351 TMC, the live storage capacity is 0.309 TMC and the dead storage capacity is 0.043 TMC by keeping FRL & MDDL at EL+460.00 m & EL+448.00 m respectively. For creating this storage, it is proposed to construct rockfill embankment for the weighted average height of around 13m (with maximum height of 18m) for the length of 4014 m.

iv. The lower reservoir is proposed to be located on the natural depression which is suitable for creating the desired gross storage capacity of 0.316 TMC. Out of 0.316 TMC, the live storage capacity is 0.304 TMC and dead storage capacity is 0.011 TMC by keeping FRL and MDDL at EL+269.00m & EL+250.00m respectively. For creating this storage, it is proposed to construct rockfill embankment for the weighted average height of 20 m (with maximum height of 27m) for the length of 1575.00 m.

v. It is proposed that One-time requirement of 0.359 TMC of water will be lifted from existing nearby Peddavagu River tributary of Pranhita River (which is located about 14 Km away from the proposed lower reservoir) and will be stored in the lower reservoir to be constructed and used cyclically for energy storage and discharge. Evaporation losses of about 0.04 TMC of water will be recouped periodically from Peddavagu River tributary of Pranhita River based on the requirement. This Project envisages non-consumptive re-utilization of 0.304 TMC of water for recirculation among two proposed reservoirs.

vi. The Cerulean-II Off-Stream Closed Loop Pumped Storage Project envisages construction of :

- Rock fill embankments of weighted average height of around 13 m with maximum of 18 m height in upper reservoir and weighted average height of around 20 m with maximum of 27 m in lower reservoir for creation of Cerulean-II upper & lower reservoir with 0.309 & 0.304 TMC live storage capacity respectively.
- 31.80 m high Power Intake Structure.
- 1 no. of 1109.20 m long and 7.0 m dia. circular steel lined Penstock / Pressure Shaft (i.e., consisting of 446.57 m long Surface Penstock, 236.05m long vertical pressure shaft, 426.57m long Horizontal pressure shaft up to powerhouse) to feed 1 unit of 320MW.

- Similarly, another 1 no. of 1009.20 m long and 7.0 m dia. circular steel lined Penstock / Pressure Shaft (i.e., consisting of 446.57 m long Surface Penstock, 236.05m long vertical pressure shaft, 326.57m long Horizontal pressure shaft up to bifurcation point) which will get bifurcated into 2 nos. near powerhouse each of 100m long and 4.9m dia. to feed 2 units of 160MW each.
- A surface Powerhouse having an installation of One reversible Francis turbine of 320 MW capacity (Fixed speed turbine) and two reversible Francis turbine each of 160MW (Both are Fixed speed turbine) operating under a rated head of 189.50 m in generating mode and 200.50 m in pumping mode.
- 3 nos. of Tail Race Tunnel of 206.60 m long (One no. of 7.5 m dia. for larger unit and Two nos. of 5.5 m dia. for smaller unit).
- 38.75 m high Outlet Structure.
- 25 wide and FSD of 5.0m Tail race channel of 1266.70 m long joining with the proposed lower reservoir.

vii. The sailent features of the project are as under: -

Project details:

Name of the Proposal	Cerulean-II Off-Stream Closed Loop Pumped Storage Project – Telangana
Location (Including coordinates)	The proposed project involves creation of Upper reservoir 19°26'33.53" N & 79°26'29.79" E and Lower reservoir 19°26'17.74" N & 79°27'32.08" E.
Inter- state issue involved	No
Seismic zone	Zone -II (least active)

Category details:

Category of the project	1(c) River Valley Projects
Provisions	
Capacity / Cultural command area (CCA)	640MW
Attracts the General Conditions (Yes/No)	No
Additional information (if any)	Nil

Electricity generation capacity:

Powerhouse Installed Capacity	640MW
Generation of Electricity Annually	1372 MU
No. of Units	3 nos. (1 X 320 MW + 2X160 MW)
Additional information (if any)	Nil

ToR/EC Details:

Cost of project	4040.83 Cr.
Total area of Project	444.78 Ha

Height of Dam from River Bed (EL)	Height of Embankment max-27 m & min 13 m
Length of Tunnel/Channel	206.60 m
Details of Submergence area	287.24 Ha
Types of Waste and quantity of generation during construction/ Operation	Muck from excavation, solid waste from labour colony and construction waste
E-Flows for the Project	Not Applicable, as this is Off-Stream Closed Loop Pumped Storage Project (PSP)
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin. If not the E-Flows maintain criteria for sustaining river ecosystem.	No

Muck Management Details:

No. of proposed disposal area/ (type of land-Forest/Pvt. land)	One Location of 25 Ha in Non-Forest
Muck Management Plan	Will be Provided in EIA/EMP report
Monitoring mechanism for Muck Disposal	Will be Provided in EIA/EMP report

Land Area Breakup:

Government land/Forest Land	286.45 Ha-Forest Land
Submergence area/Reservoir area	287.24 Ha-Upper & Lower reservoirs
Land required for project components	444.78 Ha- Total Land requirement
Additional information (if any)	158.33 Ha-Private Land

Presence of Environmentally Sensitive areas in the study area

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/No**	**Details of Certificate / letter/ Remarks**
Reserve Forest/Protected Forest Land	--	Nil
National Park	--	
Wildlife Sanctuary	--	

Court case details:

Court Case	Nil

Additional information (if any)	Nil

Affidavit/Undertaking details:

Affidavit/Undertaking	Enclosed
Additional information (if any)	Nil

Previous EC compliance and necessary approvals:

Particulars	Letter no. and date
Certified EC compliance report (if applicable)	Not Applicable
Status of Stage- I FC	Yet to Apply
Additional detail (If any)	Nil
Is FRA (2006) done for FC-I	Yet to Apply

Miscellaneous

Particulars	Details
Details of consultant	M/s. R S Envirolink Technologies Pvt. Ltd. (RSET) (NABET Accredited Consultant Organization) Certificate No: NABET/EIA/2225/RA 0274 Validity : August 15, 2025
Project Benefits	• Pumped storage hydropower is a modified use of conventional hydropower technology to store and manage energy or electricity by moving water between an upper and lower reservoir. Currently, pumped storage round-trip or cycle energy efficiencies exceed 80%, comparing favorably to other energy storage technologies and thermal technologies. This effectively shifts, stores, and reuses energy generated until there is corresponding demand for system reserves and variable energy integration. This shifting can also occur to avoid transmission congestion periods, to help more efficiently manage transmission grid, and to avoid potential interruptions to energy supply. This is important because many of the renewable energy resources being developed (e.g., wind and solar) are generated at times of low demand and off-peak energy demand periods are still being met with fossil fuel resources, often at inefficient performance levels that increase the release of greenhouse gas emissions. • Further, pumped storage projects are critical to the national economy and overall energy reliability because it's:

	○ Least expensive source of electricity, not requiring fossil fuel for generation ○ An emission-free renewable source ○ Balancing grid for demand driven variations ○ Balancing generation driven variations ○ Voltage support and grid stability • Apart from this, proposed PSP will also benefit the local community by creating employment opportunities and will result in upliftment of livelihood and socio-economic conditions.
Status of other statutory clearances	Forest Clearance: Online application seeking forest diversion for around 286.45 Ha after receipt of ToR Approval. Alongside, other statutory clearances (as applicable) from State as well as Central government will be obtained post completion of Detailed Project Report.
R&R details	Details shall be evaluated during EIA/EMP Studies.
Additional detail (If any)	Nil

viii. Alternate Layouts: Three alternative layouts for this scheme were studied.

Alternative – 1: Layout with Surface Powerhouse and other components of this scheme are Site – 1 Upper reservoir, Intake structure, Penstock / Pressure Shaft, Tail Race Tunnel, Tail Race Outlet, Tail Race Channel and Site-1 Lower reservoir.

Alternative – 2: Layout with Surface Powerhouse and other components of this scheme are Site – 2 Upper reservoir, Intake structure, Penstock / Pressure Shaft, Surge Shaft, Tail Race Tunnel, Tail Race Outlet, Tail Race Channel and Site – 2 Lower reservoir.

Alternative – 3: Layout with Surface Powerhouse and other components of this scheme are Site – 2 Upper reservoir, Intake structure, Penstock / Pressure Shaft, Surge Shaft, Tail Race Tunnel, Tail Race Outlet, Tail Race Channel and Site – 1 Lower reservoir.

Selection of Final Layout

Alternative – 1 layout has been preferred considering the following reasons:

- The length of embankment of lower reservoir for Alternative – 1 (i.e., 1575m) is less han Alternative – 2 (i.e., 1898m). Hence, cost and time can be reduced to some extent in Alternative – 1 layout.
- The length of Penstock / Pressure Shaft in Alternative – 1 is (i.e., 1109.2m) less than Alternative – 2 (i.e., 1420m). Hence, considerable cost and time can be reduced in Alternative – 1 layout.
- In addition, since the length of water conductor system is more in case of Alternative – 2 layout and L/H ratio is also more than 6, Surge shaft structure is required to be

provided as an additional structure which will increase overall project cost and time of construction further considerably.

- The total area of land required for Alternative – 1 (i.e., 444.79 Ha) is less than Alternative – 2 (i.e., 473.39 Ha).
- The area of forest land required for Alternative – 1 (i.e., 286.46 Ha) is 72.30 Ha less than Alternative – 2 (i.e., 358.76 Ha).

44.4.3 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of terms of reference to the project for Cerulean-II Off-Stream Closed Loop Pumped Storage project (640 MW) in an area of 444.78 Ha located at village Regulguda, Manikapatar & Sarkepally, Tehsil Wankidi & Kagaznagar, Disttrict Komaram Bheem (Telangana) by M/s Cerulean Energy Solutions Private Limited.

The project/activity is covered under Category A of item 1 (c) 'River Valley projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.

44.4.4 The EAC after detailed deliberation on the information submitted and as presented during the meeting ***recommended*** for grant of Standard ToR for conducting EIA study for Cerulean-II Off-Stream Closed Loop Pumped Storage project (640 MW) in an area of 444.78 Ha located at village Regulguda, Manikapatar & Sarkepally, Tehsil Wankidi & Kagaznagar, Disttrict Komaram Bheem (Telangana) by M/s Cerulean Energy Solutions Private Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

[A] Environmental Management and Biodiversity Conservation:

i. Cumulative Impact of project on carrying capacity and sustainability of Reservoir/ nalahs of catchment area / due to tapping of water for filling reservoir.
ii. Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Standard ToR shall be collected for preparation of EIA/ EMP report along with soil characteristics which shall be studied at minimum 10 locations. The ground water level at 10 locations shall be measured in project area in all three seasons.
iii. A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted for power generation and thermal stratification. Accordingly, Environment Management plan shall be prepared.
iv. Sampling locations be located to cover villages situated near the reservoir and around boundary of forest area for collection of baseline data and data to be incorporated in EIA/ EMP report.
v. Identify the sand mining/ quarrying sites in submergence area and downstream of reservoir.
vi. Source of construction material and its distance from the project site along with detailed transportation plan for construction material.
vii. A detailed reclamation/ restoration plan of quarrying site/sites be incorporated in the EIA/EMP report.
viii. Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is located outside the Eco Sensitive Zone (ESZ).
ix. A detailed wildlife conservation plan for Schedule –I species be prepared duly approved by the Chief Wild Life Warden be submitted.

x. In case any Wildlife Corridor is located within 10 km radius of the project site a detailed study shall be conducted to assess the impact of project on safe movement of wild animals.
xi. Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.
xii. Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Govt. institutions/ Indian Council of Agriculture Research (ICAR)and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.
xiii. MoU for water uses for the project shall be signed and approved by concerned authority.
xiv. Environmental matrix during construction and operational phase needs to be submitted.
xv. Matrix formulated on the basis of detailed study and field survey of flora and Fauna methodology used shall be mentioned in the EIA report.
xvi. Endemic plant and animal species found in the area concerned shall be provided instead listing entire endemic species found in the State.
xvii. Details of Flora and Fauna reported in submergence area, Nos. of tree along with their density and nomenclature of the tree species required to be felled for reservoir creation and other project component.
xviii. Project impact on avi-fauna shall be studied and incorporated in EIA/ EMP report.
xix. Impact assessment on the fish diversity based on the hydrological alteration at the water drawing sources shall be studied.
xx. Stage-I Forest Clearance shall be obtained.
xxi. Study of impacts of project on water sources i.e. Peddavagu River.

[B] Socio-economic Study

xxii. Declaration by the project proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.
xxiii. All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/ EMP report in the relevant chapter.
xxiv. Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F.No.22- 65/2017- IA.III dated 30th September, 2020 shall be submitted.
xxv. Tentative no. of project affected families shall be identified and accordingly appropriate Rehabilitation & Resettlement plan shall be prepared.
xxvi. Details of settlement in 10 km area shall be submitted.

[C] Muck Management/ Disaster Management

xxvii. Details of quantity of muck generation component wise and disposal site along with transportation plan and its monitoring to be provided.
xxviii. Details of Muck Management plan prepared along with estimated cost incorporated in EIA/ EMP report.
xxix. Techno-economic viability of the project must be recommended from CEA/ CWC

[D] Miscellaneous.

xxx. Pre-DPR Chapters viz. Layout Map and Power Potential Studies duly approved by CWC/CEA shall be submitted.
xxxi. Undertaking need to submitted on affidavit that regarding no activities has been yet started on the project site and water allocated to this scheme shall not be diverted to other purpose.
xxxii. Both capital and recurring expenditure under EMP shall be submitted.

xxxiii. The photograph should bear the date, time, latitude & longitude of the monitoring station/ sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyse the samples.

xxxiv. Arial view video of project site shall be recorded and to be submitted.

xxxv. Detailed plan to restore wider roads and convert them into narrow upto 10m after construction of the project.

Agenda Item No. 44.5

Semaliya-II Off-Stream Closed Loop Pumped Storage Project (1200 MW) in an area of 701.58 Ha located at Village Khera, Tehsil Begun, District Chittorgarh, (Rajasthan) by M/s Semaliya Energy Private Limited - Terms of Reference (TOR) - reg.

[Proposal No. IA/RJ/RIV/421332/2023; F. No. J-12011/18/2023-IA.I (R)]

44.5.1: The proposal is for grant of Terms of Reference (TOR) for Semaliya-II Off-Stream Closed Loop Pumped Storage Project (1200 MW) in an area of 701.58 Ha located at Village Khera, Tehsil Begun, District Chittorgarh, (Rajasthan) by M/s Semaliya Energy Private Limited.

44.5.2: The details of the project submitted by project proponent and ascertained from the document submitted are mentioned below:

i. M/s Semaliya Energy Private Limited (SEPL) proposes to develop Off-Stream Closed Loop Pumped Storage project (OCPSP) of 1200 MW / 7260 MWH storage capacity, located near Teekhi Ka Khera Village of Begun Tehsil in Chittorgarh District, Rajasthan.

ii. The Semaliya - II OCPSP will comprise of two reservoirs which are to be constructed newly. The geographical co-ordinates of the proposed upper reservoir are at longitude 75° 7'27.58"E and latitude is 25°4'12.73"N and that of lower reservoir are at longitude 75° 8'9.57"E and latitude 25°5'46.07"N. Proposed rating of Pumped Storage Project is 1200 MW.

iii. The upper reservoir is proposed to be located on flat / gradually sloping land which is suitable for creating the desired gross storage capacity of 0.799 TMC by doing excavation up to the desired level. Out of 0.799 TMC, the live storage capacity is 0.679 TMC and the dead storage capacity is 0.12 TMC by keeping FRL & MDDL at EL 585.00m & EL 571.00m respectively. For creating this storage, it is proposed to construct rockfill embankment for the weighted average height of around 18m (with maximum height of 28m) for the length of 6435 m.

iv. The lower reservoir is proposed to be located in the gorge portion which is suitable for creating the desired gross storage capacity of 0.692 TMC by doing excavation up to the desired level. Out of 0.692 TMC, the live storage capacity is 0.669 TMC and dead storage capacity is 0.020 TMC by keeping FRL and MDDL at EL 425.00m & EL 405.00m respectively. For creating this storage, it is proposed to construct rockfill embankment for he weighted average height of 21m (with maximum height of 28m) for the length of 1331m.

v. It is proposed that One-time requirement of 0.812 TMC of water to be lifted from existing nearby Berach River, tributary of Banas River (which is located about 37Km away from the proposed lower reservoir) and will be stored in the lower reservoir to be constructed and used cyclically for energy storage and discharge. Evaporation losses will be recouped periodically from Berach River, tributary of Banas River based on the requirement. This Project envisages non-consumptive re-utilization of 0.669 TMC of water for recirculation among two proposed reservoirs.

vi. The Semaliya - II Off-Stream Closed Loop Pumped Storage Project envisages construction of:

- Rock fill embankments of weighted average height of around 18m with maximum of 28m height in upper reservoir and weighted average height of around 21m with maximum of 28m in lower reservoir for creation of Semaliya - II upper & lower reservoir with 0.679 & 0.669 TMC live storage capacity respectively.
- 35.75m high Power Intake Structure
- 3 nos. each of 904.80 m long and 7.5m dia. surface circular steel lined Penstock / Pressure Shaft (i.e., consisting of 541.70m long surface penstock, 116.19 m long vertical pressure shaft and 246.91 m long Horizontal pressure shaft) will feed 3 units of 300 MW. Similarly, one no. of 804.80 m long 7.5m dia. Surface circular steel lined Penstock / Pressure Shaft (i.e., consisting of 541.70m long surface penstock, 116.19m long vertical pressure shaft and 146.91m long Horizontal pressure shaft up to bifurcation point) which will get bifurcated into 2 nos. near power house each of 00m long and 5.3m dia. to feed 2 units of 150MW.
- A surface Powerhouse having an installation of three reversible Francis turbine each of 300 MW capacity (all units are Fixed speed turbines) and two reversible Francis turbine each of 150MW (both are Fixed speed turbines) operating under a rated head of 158 m in generating mode and 169 m in pumping mode.
- 55m wide and FSD of 5.0m Tail race channel of 1114.50 m long joining with the proposed lower reservoir.

vii. The sailent features of the project are as under: -

Project details:

Name of the Proposal	Semaliya-II Off-Stream Closed Loop Pumped Storage Project (1200MW), Rajasthan
Location (Including coordinates)	The proposed project involves creation of Upper reservoir at longitude 75° 7'27.58"E and latitude is 25°4'12.73"N and Lower reservoir at longitude 75° 8'9.57"E and latitude 25°5'46.07"N
Inter- state issue involved	No
Seismic zone	Zone -II (least active)

Category details:

Category of the project	1(c) River Valley Projects
Provisions	
Capacity / Cultural command area (CCA)	1200 MW
Attracts the General Conditions (Yes/No)	Yes
Additional information (if any)	Nil

Electricity generation capacity:

Powerhouse Installed Capacity	1200 MW (7260 MWH)
Generation of Electricity Annually	2517 MU
No. of Units	5 nos. (3 X 300 MW + 2X150 MW)
Additional information (if any)	Nil

ToR/EC Details:

Cost of project	7630.93 Cr
Total area of Project	701.58 Ha
Height of Dam from River Bed (EL)	Upper Reservoir-Height of Embankment max-28 m & Avg-18 m Lower Reservoir- Height of Embankment max-28 m & Avg-21 m
Length of Tunnel/Channel	282.11 m
Details of Submergence area	453.24 Ha
Types of Waste and quantity of generation during construction/ Operation	Muck from excavation, solid waste from labour colony and construction waste
E-Flows for the Project	Not Applicable, as this is Off-Stream Closed Loop Pumped Storage Project (OCPSP)
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin. If not the E-Flows maintain criteria for sustaining river ecosystem.	No

Muck Management Details:

No. of proposed disposal area/ (type of land-Forest/Pvt. land)	One Location of 40 Ha in Forest Area
Muck Management Plan	Will be Provided in EIA/EMP report
Monitoring mechanism for Muck Disposal	Will be Provided in EIA/EMP report

Land Area Breakup:

Government land/Forest Land	Forest Land- 545.19 Ha
Submergence area/Reservoir area	453.24 Ha-Upper & Lower reservoirs

Land required for project components	701.58 Ha- Total Land requirement
Additional information (if any)	156.39 Ha-Non-Forest Land

Presence of Environmentally Sensitive areas in the study area

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/No**	**Details of Certificate / letter/ Remarks**
Reserve Forest/Protected Forest Land	--	Distance from nearest protected area (Bassi WLS) is 1.2 Km, however, proposed project is outside from notified ESZ boundary of Bassi WLS.
National Park	--	
Wildlife Sanctuary	--	

Court case details:

Court Case	Nil
Additional information (if any)	Nil

Affidavit/Undertaking details:

Affidavit/Undertaking	Enclosed
Additional information (if any)	Nil

Previous EC compliance and necessary approvals:

Particulars	**Letter no. and date**
Certified EC compliance report (if applicable)	Not Applicable
Status of Stage- I FC	Yet to Apply
Additional detail (If any)	Nil
Is FRA (2006) done for FC-I	Yet to Apply

Miscellaneous

Particulars	**Details**
Details of consultant	M/s. R S Envirolink Technologies Pvt. Ltd. (RSET) (NABET Accredited Consultant Organization) Certificate No: NABET/EIA/2225/RA0274 Validity : August 15, 2025
Project Benefits	• Pumped storage hydropower is a modified use of conventional hydropower technology to store and manage energy or electricity by moving water between an upper and lower reservoir. Currently, pumped storage round-trip or cycle energy efficiencies exceed 80%, comparing favorably to

	other energy storage technologies and thermal technologies. This effectively shifts, stores, and reuses energy generated until there is corresponding demand for system reserves and variable energy integration. This shifting can also occur to avoid transmission congestion periods, to help more efficiently manage transmission grid, and to avoid potential interruptions to energy supply. This is important because many of the renewable energy resources being developed (e.g., wind and solar) are generated at times of low demand and off-peak energy demand periods are still being met with fossil fuel resources, often at inefficient performance levels that increase the release of greenhouse gas emissions. • Further, pumped storage projects are critical to the national economy and overall energy reliability because it's: o Least expensive source of electricity, not requiring fossil fuel for generation o An emission-free renewable source o Balancing grid for demand driven variations o Balancing generation driven variations o Voltage support and grid stability • Apart from this, proposed PSP will also benefit the local community by creating employment opportunities and will result in upliftment of livelihood and socio-economic conditions.
Status of other statutory clearances	Forest Clearance: Online application seeking forest diversion for around 545.19 Ha after receipt of ToR Approval. Alongside, other statutory clearances (as applicable) from State as well as Central government will be obtained post completion of Detailed Project Report.
R&R details	Details shall be evaluated during EIA/EMP Studies
Additional detail (If any)	Nil

viii. Alternate Layouts: Three alternative layouts for this scheme were studied.

Alternative – 1: Layout with Surface Powerhouse and other components of this scheme are Site – 1 Upper reservoir, Intake structure, Penstock / Pressure Shaft, Tail Race Tunnel, Tail Race Outlet, Tail Race Channel and Site-1 Lower reservoir.

Alternative – 2: Layout with Surface Powerhouse and other components of this scheme are Site – 2 Upper reservoir, Intake structure, Penstock / Pressure Shaft, Surge Shaft, Tail Race Tunnel, Tail Race Outlet, Tail Race Channel and Site – 2 Lower reservoir.

Alternative – 3: Layout with Surface Powerhouse and other components of this scheme are Site – 2 Upper reservoir, Intake structure, Penstock / Pressure Shaft, Surge Shaft, Tail Race Tunnel, Tail Race Outlet, Tail Race Channel and Site – 1 Lower reservoir.

Selection of Final Layout
Alternative – 1 layout has been preferred considering the following reasons:

- The length of embankment of lower reservoir for Alternative -1 is less (i.e., 1331 m) than Alternative – 2 (i.e., 2144 m).
- The depth of excavation required for powerhouse in Alternative -1 is less (i.e., 76m) than Alternative – 2 & 3 (i.e., 136m). The length of penstock / Pressure shaft in Alternative -1 is less (i.e., 904.80m) than lternative – 3 (i.e., 1104m).
- The length of Tail Race Channel in Alternative – 1 is less (1114.50m) than Alternative – 2 & 3 (i.e., 1370m & 1129m respectively).
- In Alternative – 2, the land area required for lower reservoir is partly in forest land and partly in private land. Because of this reason, the forest land area requirement in Alternative – 2 is less than Alternative – 1. Since, the lower reservoir is encroaching the habitation area and the existing roads connecting the villages and is very close to Sadalpur Village, Keeping the reservoir in this location will cause disturbance and dislocation of large number of populations and realignment roads which will create social and environmental issues. Therefore, Alternative – 2 layout is not considered.
- The total area of land required for Alternative – 1 is less (i.e., 701.58 Ha) than Alternative – 2 & 3 (i.e., 711.32 Ha & 757.26 Ha respectively).
- The forest land area required for Alternative -1 is less (i.e.,545.19 Ha) than Layouts of all three alternatives.

44.5.3 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of terms of reference to the project for Semaliya-II Off-Stream Closed Loop Pumped Storage Project (1200 MW) in an area of 701.58 Ha located at Village Khera, Tehsil Begun, District Chittorgarh, (Rajasthan) by M/s Semaliya Energy Private Limited.

The project/activity is covered under Category A of item 1 (c) 'River Valley projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.

44.5.4 The EAC after detailed deliberation on the information submitted and as presented during the meeting ***recommended*** for grant of Standard ToR for conducting EIA study for Semaliya-II Off-Stream Closed Loop Pumped Storage Project (1200 MW) in an area of 701.58 Ha located at Village Khera, Tehsil Begun, District Chittorgarh, (Rajasthan) by M/s Semaliya Energy Private Limited,

under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

[A] Environmental Management and Biodiversity Conservation:

i. Cumulative Impact of project on carrying capacity and sustainability of Reservoir/ nalahs of catchment area / due to tapping of water for filling reservoir.
ii. Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Standard ToR shall be collected for preparation of EIA/ EMP report along with soil characteristics which shall be studied at minimum 10 locations. The ground water level at 10 locations shall be measured in project area in all three seasons.
iii. A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted for power generation and thermal stratification. Accordingly, Environment Management plan shall be prepared.
iv. Sampling locations be located to cover villages situated near the reservoir and around boundary of forest area for collection of baseline data and data to be incorporated in EIA/ EMP report.
v. Identify the sand mining/ quarrying sites in submergence area and downstream of reservoir.
vi. Source of construction material and its distance from the project site along with detailed transportation plan for construction material.
vii. A detailed reclamation/ restoration plan of quarrying site/sites be incorporated in the EIA/EMP report.
viii. Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is located outside the Eco Sensitive Zone (ESZ) of Bassi WLS.
ix. A detailed wildlife conservation plan for Schedule –I species be prepared duly approved by the Chief Wild Life Warden be submitted.
x. In case any Wildlife Corridor is located within 10 km radius of the project site a detailed study shall be conducted to assess the impact of project on safe movement of wild animals.
xi. Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.
xii. Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Govt. institutions/ Indian Council of Agriculture Research (ICAR)and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.
xiii. MoU for water uses for the project shall be signed and approved by concerned authority.
xiv. Environmental matrix during construction and operational phase needs to be submitted.
xv. Matrix formulated on the basis of detailed study and field survey of flora and Fauna methodology used shall be mentioned in the EIA report.
xvi. Endemic plant and animal species found in the area concerned shall be provided instead listing entire endemic species found in the State.
xvii. Details of Flora and Fauna reported in submergence area, Nos. of tree along with their density and nomenclature of the tree species required to be felled for reservoir creation and other project component.
xviii. Project impact on avi-fauna shall be studied and incorporated in EIA/ EMP report.
xix. Impact assessment on the fish diversity based on the hydrological alteration at the water drawing sources shall be studied.
xx. Stage-I Forest Clearance shall be obtained.
xxi. Study of impacts of project on water sources i.e. Berach River.

[B] Socio-economic Study

xxii. Declaration by the project proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.
xxiii. All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/ EMP report in the relevant chapter.
xxiv. Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F.No.22- 65/2017- IA.III dated 30th September, 2020 shall be submitted.
xxv. Tentative no. of project affected families shall be identified and accordingly appropriate Rehabilitation & Resettlement plan shall be prepared.
xxvi. Details of settlement in 10 km area shall be submitted.

[C] Muck Management/ Disaster Management

xxvii. Details of quantity of muck generation component wise and disposal site along with transportation plan and its monitoring to be provided.
xxviii. Details of Muck Management plan prepared along with estimated cost incorporated in EIA/ EMP report.
xxix. Techno-economic viability of the project must be recommended from CEA/ CWC

[D] Miscellaneous.

xxx. Pre-DPR Chapters viz. Layout Map and Power Potential Studies duly approved by CWC/CEA shall be submitted.
xxxi. Undertaking need to submitted on affidavit that regarding no activities has been yet started on the project site and water allocated to this scheme shall not be diverted to other purpose.
xxxii. Both capital and recurring expenditure under EMP shall be submitted.
xxxiii. The photograph should bear the date, time, latitude & longitude of the monitoring station/ sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyse the samples.
xxxiv. Arial view video of project site shall be recorded and to be submitted.
xxxv. Detailed plan to restore wider roads and convert them into narrow upto 10m after construction of the project.

Agenda Item No. 44.6

Astha Telangana Off-Stream Closed Loop Pumped Storage Project (600 MW), in an area of 419.43 Ha located at Village Mailaram, District Nizamabad (Telangana) by M/s Astha Green Energy Ventures India Private Limited – Reconsideration for Terms of Reference (TOR) – reg.

[Proposal No. IA/TG/RIV/409916/2022; F. No. J-12011/20/2022-IA.I (R)]

44.6.1: The proposal is for grant of Terms of Reference (TOR) for Astha Telangana Off-Stream Closed Loop Pumped Storage Project (600 MW), in an area of 419.43 Ha located at Village Mailaram, District Nizamabad (Telangana) by M/s Astha Green Energy Ventures India Private Limited.

44.6.2: The proposal was last considered by the EAC in its 39th meeting held on 28th December, 2022, wherein the EAC note that "*... disposal of muck is proposed in an area of 24 ha Forest land and alternative site analysis keeping in view the ecological aspects viz. loss of Forest ecosystem due to diversion of Forest land/loss of biodiversity and its impacts on productivity of the ecosystem, has not*

been done properly. Therefore, EAC suggested to submit the revised project layout after reducing the forest area, in overall land requirement for project components including muck disposal sites, job facility area etc….." and deferred the proposal.

The project proponent has submitted the point wise reply vide its letter dated 14.03.2023 is as under :-

i. Comparative Area Statement of Proposed Off Stream Closed Loop PSP:

#	**Project Components**	**Previous**			**Now (Updated)**		
		Forest (Ha)	Non-Forest (Ha)	Total Area (Ha)	Forest (Ha)	Non-Forest (Ha)	Total Area (Ha)
1	Upper Reservoir	92.12	0.00	92.12	92.12	0.00	92.12
2	Lower Reservoir	166.92	35.42	202.34	166.92	35.42	202.34
3	WCS	20.29	4.96	25.25	20.29	4.96	25.25
4	Adit	1.78	0.00	1.78	1.78	0.00	1.78
5	Road to Powerhouse	5.31	0.00	5.31	5.31	0.00	5.31
6	Road to Upper reservoir, WCS	17.40	0.00	17.40	17.40	0.00	17.40
7	Road to Magazine	2.17	0.00	2.17	0.00	1.44	1.44
8	Road to Lower reservoir, Muck Disposal, Job facility area	13.17	0.00	13.17	15.30	0.85	16.15
9	Muck Disposal area	25.00	0.00	25.00	0.00	25.00	25.00
10	Job Facilities Area	15.00	0.00	15.00	0.00	15.00	15.00
11	Magazine (Explosive storage facility)	0.10	0.00	0.10	0.00	0.10	0.10
12	Pump House & Pumping Alignment	0.00	19.79	19.79	0.00	19.79	19.79
	Total	**359.26**	**60.17**	**419.43**	**319.12**	**102.56**	**421.68**

Muck Disposal Area, Job Facilities Area have been completely moved to Non-Forest Land.

ii. Alternate Layouts:

Three alternative layouts for this scheme were studied.
Alternative – 1: Layout with Surface Powerhouse and other components of this scheme are Site – 1Upper reservoir, Intake structure, Penstock / Pressure Shaft, Tail Race Tunnel, Tail Race Outlet, TailRace Channel and Site-1 Lower reservoir.

Alternative – 2: Layout with Surface Powerhouse and other components of this scheme are Site – 2Upper reservoir, Intake structure, Penstock / Pressure Shaft, Tail Race Tunnel, Tail Race Outlet, TailRace Channel and Site – 1 Lower reservoir.

Alternative – 3: Layout with Surface Powerhouse and other components of this scheme are Site – 2Upper reservoir, Intake structure, Penstock / Pressure Shaft, Tail Race Tunnel, Tail Race Outlet, TailRace Channel and Site – 2 Lower reservoir.

Selection of Final Layout
Alternative – 1 layout has been preferred considering the following reasons:

- The length of embankment of upper reservoir for Alternative -1 (i.e., 1214 m) is less than Alternative 2 (i.e., 3318 m). Also, the maximum height of embankment of upper reservoir for Alternative – 1 is 47 m whereas for Alternative – 2 is 53m. Hence, considerable cost and time can be reduced for Alternative – 1layout.
- The area of land required for upper reservoir for Alternative – 1 is less than Alternative – 2
- The length of Penstock for Alternative -2 (i.e., 862 m) is more than Alternative – 1 (i.e., 659 m) whichwill increase Penstock cost substantially.
- The length of Tail Race Channel for Alternative – 2 (i.e., 2340 m) is more than Alternative – 1 (i.e., 838 m) which will increase cost and time of the project.
- The length of Penstock for Alternative -3 (i.e., 857 m) is more than Alternative – 1 (i.e., 659 m) whichwill increase Penstock cost substantially.
- In lower reservoir of Alternative – 3 layout, considerable area of lower reservoir is in private land. On detailed assessment for Social and environmental aspects it was observed that this area is located in populated and cultivated area and School, Temple and National Highways are existing.
- Keeping the reservoir in this location will cause disturbance and dislocation of number of populations, dislocation of School and diversion of National Highway creating social and environmental issues. Whereas in case of Alternative – 1, almost the entire area of lower reservoir is in forest land and no social and environmental issues are envisaged.
- The total area of land required in Alternative – 2 & 3 (i.e., 500.05 Ha & 568.62 Ha respectively) are more than Alternative – 1 (i.e., 421.68 Ha).
- The forest land area required in Alternative – 2 (i.e., 389.40 Ha) is more than Alternative – 1 (i.e., 319.12 Ha).

44.6.3 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of terms of reference to the project for Astha Telangana Off-Stream Closed Loop Pumped Storage Project (600 MW), in an area of 419.43 Ha located at Village Mailaram, District Nizamabad (Telangana) by M/s Astha Green Energy Ventures India Private Limited.

The project/activity is covered under Category A of item 1 (c) 'River Valley projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.

44.6.4 The EAC after detailed deliberation on the information submitted and as presented during the meeting ***recommended*** for grant of Standard ToR for conducting EIA study for Astha Telangana Off-Stream Closed Loop Pumped Storage Project (600 MW), in an area of 419.43 Ha located at Village Mailaram, District Nizamabad (Telangana) by M/s Astha Green Energy Ventures India Private Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

[A] Environmental Management and Biodiversity Conservation:

i. Cumulative Impact of project on carrying capacity and sustainability of Reservoir/ nalahs of catchment area / due to tapping of water for filling reservoir.

ii. Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Standard ToR shall be collected for

preparation of EIA/ EMP report along with soil characteristics which shall be studied at minimum 10 locations. The ground water level at 10 locations shall be measured in project area in all three seasons.

iii. A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted for power generation and thermal stratification. Accordingly, Environment Management plan shall be prepared.

iv. Sampling locations be located to cover villages situated near the reservoir and around boundary of forest area for collection of baseline data and data to be incorporated in EIA/ EMP report.

v. Identify the sand mining/ quarrying sites in submergence area and downstream of reservoir.

vi. Source of construction material and its distance from the project site along with detailed transportation plan for construction material.

vii. A detailed reclamation/ restoration plan of quarrying site/sites be incorporated in the EIA/EMP report.

viii. Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is located outside the Eco Sensitive Zone (ESZ).

ix. A detailed wildlife conservation plan for Schedule –I species be prepared duly approved by the Chief Wild Life Warden be submitted.

x. In case any Wildlife Corridor is located within 10 km radius of the project site a detailed study shall be conducted to assess the impact of project on safe movement of wild animals.

xi. Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.

xii. Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Govt. institutions/ Indian Council of Agriculture Research (ICAR)and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.

xiii. MoU for water uses for the project shall be signed and approved by concerned authority.

xiv. Environmental matrix during construction and operational phase needs to be submitted.

xv. Matrix formulated on the basis of detailed study and field survey of flora and Fauna methodology used shall be mentioned in the EIA report.

xvi. Endemic plant and animal species found in the area concerned shall be provided instead listing entire endemic species found in the State.

xvii. Details of Flora and Fauna reported in submergence area, Nos. of tree along with their density and nomenclature of the tree species required to be felled for reservoir creation and other project component.

xviii. Project impact on avi-fauna shall be studied and incorporated in EIA/ EMP report.

xix. Impact assessment on the fish diversity based on the hydrological alteration at the water drawing sources shall be studied.

xx. Stage-I Forest Clearance shall be obtained.

xxi. Study of impacts of project on water sources i.e. Pedda Vagu River

[B] Socio-economic Study

xxii. Declaration by the project proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.

xxiii. All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/ EMP report in the relevant chapter.

xxiv. Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F.No.22- 65/2017- IA.III dated 30th September, 2020 shall be submitted.

xxv. Tentative no. of project affected families shall be identified and accordingly appropriate Rehabilitation & Resettlement plan shall be prepared.

xxvi. Details of settlement in 10 km area shall be submitted.

[C] Muck Management/ Disaster Management

xxvii. Details of quantity of muck generation component wise and disposal site along with transportation plan and its monitoring to be provided.

xxviii. Details of Muck Management plan prepared along with estimated cost incorporated in EIA/ EMP report.

xxix. Techno-economic viability of the project must be recommended from CEA/ CWC

[D] Miscellaneous.

xxx. Pre-DPR Chapters viz. Layout Map and Power Potential Studies duly approved by CWC/CEA shall be submitted.

xxxi. Undertaking need to submitted on affidavit that regarding no activities has been yet started on the project site and water allocated to this scheme shall not be diverted to other purpose.

xxxii. Both capital and recurring expenditure under EMP shall be submitted.

xxxiii. The photograph should bear the date, time, latitude & longitude of the monitoring station/ sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyse the samples.

xxxiv. Arial view video of project site shall be recorded and to be submitted.

xxxv. Detailed plan to restore wider roads and convert them into narrow upto 10m after construction of the project.

Agenda Item No. 44.7

Upper Indravati Pumped Storage Project 600 MW (4x150 MW) in an area of 164 Ha located at Village Mukhiguda, Kalahandi District (Odisha) by M/s Odisha Hydro Power Corporation Limited- Terms of Reference (TOR) - reg.

[Proposal No. IA/OR/RIV/421598/2023; F. No. J-12011/09/2023-IA.I (R)]

44.2.7 The proposal is for grant of Terms of Reference to the project for Upper Indravati Pumped Storage Project 600 MW (4x150 MW) in an area of 164 Ha located at Village Mukhiguda, Kalahandi District (Odisha) by M/s Odisha Hydro Power Corporation Limited.

44.2.7 The details of the project submitted by project proponent and ascertained from the document submitted are mentioned below:

i. M/s Odisha Hydro Power Corporation Ltd (OHPC) proposes to set up a new hydro power project in near vicinity of the Upper Indrāvati Pumped Storage Project (UIPSP) by utilizing water from the existing reservoir of the UIHEP without abstracting any additional water from the reservoir.

ii. Earlier, ToR was accorded to proposed project by MoEF&CC vide Letter no. J-12011/40/2016-IA-I (R) dated 24th Jan, 2016**.**

iii. The Upper Indrāvati Hydro-Electric Project (UIHEP) is a large multipurpose project on the Indrāvati River, covering Kalahandi, Koraput and Nabarangpur Districts of South-Western Odisha. It is located near Mukhiguda village in Kalahandi District. The existing Upper Indravati Multipurpose Project in Odisha state comprises of 4 dams namely (1) Indravati dam on Indravati river, (2) Kapur dam on Kapurnallah, (3) Muran dam on Muranriver and (4) Podagada dam to form a common reservoir for utilization of their water resources for irrigation and Hydro-power development.

iv. Upper reservoir: The present scheme aims to utilize the existing Upper Indravati Multipurpose Project (called as Upper Reservoir) which already has 600MW capacity machines. This reservoir intercepts an area of 2630 Sq km and has a gross storage/Live storage capacity as 2307/1455 MCM. No modifications are proposed in the existing Upper Indravati reservoir and as such, no modifications in the operating levels and existing structures are needed/ proposed. The existing Reservoir having live storage capacity of 1455.76 Mm3, created for the UIHEP will act as the Upper Reservoir. The water will be used from this reservoir through tunnel for the present scheme during the peak period of 5 hours and the same water will be replaced during off peak period from lower reservoir to upper reservoir.

v. Lower reservoir: A new small reservoir has been proposed after construction in the foothills of Mukhiguda Town. This will act as a balancing reservoir to enable storage of water released after hydro-power generation through proposed installation of 4x150 MW PSP Units. The live storage capacity of this new lower reservoir is 4.0 MCM. The water needed in this proposed PSP Unit shall be recycled and there is no consumptive use of water except Only one time requirement of water of 3.78 MCM is needed which shall be re-cycled during operation of PSP. The lower reservoir of proposed Upper Indrāvati Pump Storage Project (UIPSP) is located at Lat. $19^0 25' 20''$ N and Long. $82^0 51' 5.0''$ E, near Ranibahal Village in Kalahandi District of Odisha. Ranibahal village is situated at about 1 km from Mukhiguda town. District Headquarter is at Bhawanipatna which is at about 90 km from Mukhiguda town by road. The location of Power Intake is situated at Lat. 19^0 23.267' N & Long. 82^0 52.198' E.

vi. The Lower Reservoir was proposed to be formed with Zoned Earth Embankments of 18m height to act as a Balancing Reservoir in the downstream in the foothill towards Mukhiguda to serve as a buffer stock so as to feed back its water into the Upper Reservoir by pumping. Live storage of this storage was estimated to around 3.78 Mm3 whereas gross storage is estimated as 4 Mm3. Area of the proposed reservoir at FRL is around 29.7 Ha. The width of the reservoir is 530 m and varying length from 530m to 605m.

vii. The proposed 600MW pumped storage plant will be underground located in the adjoining area. The power plant shall be equipped with reversible type hydroelectric unit (4 nos.) each having a generator motor and a pump reversible turbine with a generating capacity of 150 MW.

viii. The proposed scheme envisages to utilize only 4 MCM (live storage capacity of lower reservoir proposed) through re-cycling of water from upper reservoir which is existing and meeting the irrigation and water for hydro-power generation, as such hydrological study is required to the extent to see that this requirement of 4.0 MCM (one time) do not alter the release pattern and requirements of existing scheme i.e., meeting irrigation and hydro-power requirement of existing command.

ix. The sailent features of the project are as under: -

Project details:

Name of the Proposal	Upper Indravati Pumped Storage Project
Location (Including coordinates)	Near Ranibahal Village in Kalahandi District of Odisha

	Lat. $19^0 25' 20''$ N and Long. $82^0 51' 5.0''$ E
Inter- state issue involved	No, clearance has been received from CWC
Seismic zone	Zone II

Category details:

Category of the project	Pumped Storage Hydro- Electric Project
Provisions	
Capacity / Cultural command area (CCA)	N.A
Attracts the General Conditions (Yes/No)	No
Additional information (if any)	

Electricity generation capacity:

Powerhouse Installed Capacity	600 MW
Generation of Electricity Annually	1040 GWh/ MU
No. of Units	4 units
Additional information (if any)	

ToR/EC Details:

Cost of project	3121.79 /- crores (with GST)
Total area of Project	164 ha
Height of Dam from River Bed (EL)	27 m
Length of Tunnel/Channel	3700m (HRT+PS+TRT), and additional 3468 m adit tunnels to all project components.
Details of Submergence area	18 ha Forest land and 12 ha Private land
Types of Waste and quantity of generation during construction/ Operation	Solid waste generation- 0.63 tonne/day Liquid waste generation- 0.324 MLD Muck Generation-5.1 Mm^3
E-Flows for the Project	Only applicable during the reservoir filling season
Is Projects earlier studies in Cumulative Impact assessment& Carrying Capacity	NA
Studies (CIA&CC) for River in which project located. If yes, then a) E-flow with TOR/Recommendation by EAC as per CIA&CC study of River Basin. b) If not the E-flows maintain criteria for sustaining river ecosystem.	NA

Muck Management Details:

No. of proposed disposal area/(type of land-Forest/Pvt. land)	2 Muck Disposal Site identified (42.5 ha) OHPC/ Forest land
Muck Management Plan	Shall be prepared as a part of EIA Study
Monitoring mechanism for Muck Disposal	

Land Area Breakup:

Private land	25 ha
Government land/Forest Land	35 ha
Submergence area/Reservoir area	30 ha
Land required for project components	64.893 ha
Additional information (if any)	15 ha (OHPC Land)

Presence of Environmentally Sensitive areas in the study area

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/No**	**Details of Certificate/letter/Remarks**
Reserve Forest/Protected Forest Land	No	
National Park	No	
Wildlife Sanctuary	No	

Court case details:

Court Case	N.A
Additional information (if any)	

Affidavit/Undertaking details:

Affidavit/Undertaking	N.A
Additional information (if any)	

Previous EC compliance and necessary approvals:

Particulars	**Letter no. and date**
Certified EC compliance report (if applicable)	NA
Status of Stage- I FC	Yet To Be Applied
Additional detail (If any)	
Is FRA (2006) done for FC-I	

Miscellaneous

Particulars	**Details**
Details of consultant	WAPCOS LTD.
Project Benefits	Annual peak energy generation of 1040 MU
Status of other statutory clearances	
R&R details	Shall be done as a part of EIA Study
Additional detail (If any)	

44.7.3: The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of Terms of Reference to the project for Upper Indravati Pumped Storage Project 600 MW (4x150 MW) in an area of 164 Ha located at Village Mukhiguda, Kalahandi District (Odisha) by M/s Odisha Hydro Power Corporation Limited.

The project/activity is covered under Category A of item 1 (c) 'River Valley projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.

The EAC noted that presentation made by the PP/ consultant WAPCOS is not satisfactory as it could not highlight major issues like eco-sensitivity of the region, land area requirement showing project components proposed in forest land, etc. It was also not explained why project has been categorised as closed loop PSP, when upper reservoir is located on the river Indravati and water from Indravati river will be lifted on daily basis. The PP during discussion informed that some construction activities (sub-surface exploration) have already been started, so, the EAC desired to verify the status of construction activities at site.

The EAC therefore decided to conduct site visit by EAC sub-committee before making any recommendations on proposal.

*The proposal was **deferred** on the above lines.*

Agenda Item No. 44.8

Astha UP Off-Stream Closed Loop Pumped Storage project (640 MW) in an area of 316.63 Ha located at Village Katra and Sansarpur, Tehsil Lalgang and Koraon, District Mirzapur and Prayagraj (Uttar Pradesh) by M/s Astha Green Energy Ventures India Pvt. Ltd - Terms of Reference (TOR) - reg.

[Proposal No. IA/UP/RIV/421859/2023; F. No. J-12011/10/2023-IA.I (R)]

44.8.1: The proposal is for grant of Terms of Reference (TOR) for Astha UP Off-Stream Closed Loop Pumped Storage project (640 MW) in an area of 316.63 Ha located at Village Katra and Sansarpur, Tehsil Lalgang and Koraon, District Mirzapur and Prayagraj (Uttar Pradesh) by M/s Astha Green Energy Ventures India Pvt. Ltd.

44.8.2: The details of the project submitted by project proponent and ascertained from the document submitted are mentioned below:

i. M/s Astha Green Energy Ventures India Pvt Ltd. proposes to develop Astha UP Pumped Storage Project envisaged as Off-Stream Closed Loop Pumped Storage project (OCPSP) of 640 MW / 3878 MWH storage capacity located near Katra Village of Lalgang Tehsil in Mirzapur District and Sansarpur Village of Koraon Tehsil in Prayagraj District in state of Uttar Pradesh.

ii. The geographical co-ordinates of the proposed upper reservoir are at longitude 82°06'27.97"E and latitude is 24°51'26.33"N and that of lower reservoir are at longitude 82°05'17.52"E and latitude 24°51'27.18"N. Proposed rating of Pumped Storage Project is 640 MW.

iii. The Astha UP OCPSP will comprise of two reservoirs which are to be constructed newly. The upper reservoir is proposed to be located on natural depression which is suitable for creating the desired gross storage capacity of 0.322 TMC by doing excavation up to the desired level. Out of 0.322 TMC, the live storage capacity is 0.30 TMC and the dead storage capacity is 0.022 TMC by keeping FRL & MDDL at EL 355.00 m & EL 335.00 m respectively. For creating this storage, it is proposed to construct rockfill embankment for the weighted average height of around 13m (with maximum height of 33m) for the length of 2700m.

iv. The lower reservoir is proposed to be located on the flat / gradually sloping land which is suitable for creating the desired gross storage capacity of 0.324 TMC by doing excavation up to the desired level. Out of 0.324 TMC, the live storage capacity is 0.298 TMC and dead storage capacity is 0.026 TMC by keeping FRL and MDDL at EL 159.00m & EL 142.00m respectively. For creating this storage, it is proposed to construct rockfill embankment for the weighted average height of 19 m (with maximum height of 27m) for the length of 2043 m.

v. It is proposed that One-time requirement of 0.346 TMC of water will be lifted from existing nearby Belan Nadi tributary of Tauns River and further tributary of Yamuna River (which is located about 8 Km away from the proposed lower reservoir) and will be stored in the lower reservoir to be constructed and used cyclically for energy storage and discharge. Evaporation losses of about 0.045 TMC of water will be recouped periodically from Belan Nadi tributary of Tauns River and further tributary of Yamuna River based on the requirement. This Project envisages non-consumptive re-utilization of 0.298 TMC of water for recirculation among two proposed reservoirs.

vi. The Astha UP Off-Stream Closed Loop Pumped Storage Project envisages construction of:

- Rock fill embankments of weighted average height of around 13m with maximum of 33m height in upper reservoir and weighted average height of around 19 m with maximum of 27 m in lower reservoir for creation of Astha UP upper & lower reservoir with 0.300 & 0.298 TMC live storage capacity respectively.
- 41.10 m high Power Intake Structure.
- 1 no. of 878.14 m long and 7.00m dia. circular steel lined Penstock / Pressure Shaft (i.e., consisting of 218.41 m long Intake Tunnel, 312.67 m long surface penstock, 149.51 m long vertical pressure shaft and 197.54 m long Horizontal pressure shaft up to powerhouse) to feed one unit of 320 MW unit.
- Similarly, another one no. of 778m long 7.0 m dia. circular steel lined Penstock / Pressure haft (i.e., consisting of 218.41 m long Intake Tunnel, 312.67 m long surface penstock, 149.51 m long vertical pressure shaft and 97.54 m long Horizontal pressure shaft up to bifurcation point) which will get bifurcated into 2 nos. near powerhouse each of 100m long and 4.95m Dia. to feed 2 units of 160 MW each.
- A surface Powerhouse having an installation of one reversible Francis turbine of 320 MW capacity (Fixed speed turbine) and two reversible Francis turbine each of 160MW (Fixed speed turbine) operating under a rated head of 189.50 m in generating mode and 200.50 m in pumping mode.
- 3 nos. of Tail Race Tunnel of 205.23m long (One no. of 7.5m dia. for larger unit and Two nos. of 5.6m dia. for smaller unit).

vii. The sailent features of the project are as under: -

Project details:

Name of the Proposal	Astha UP Off-Stream Closed Loop Pumped Storage Project - Uttar Pradesh
Location (Including coordinates)	The proposed upper reservoir are at longitude 82°06'27.97"E and latitude is 24°51'26.33"N and that of lower reservoir are at longitude 82°05'17.52"E and latitude 24°51'27.18"N.
Inter- state issue involved	No
Seismic zone	Zone -IV (least active)

Category details:

Category of the project	1(c) River Valley Projects
Provisions	
Capacity / Cultural command area (CCA)	640MW
Attracts the General Conditions (Yes/No)	Yes
Additional information (if any)	Nil

Electricity generation capacity:

Powerhouse Installed Capacity	640MW
Generation of Electricity Annually	1345 MU
No. of Units	3 Nos. (1 X 320 MW) + (2 X 160 MW)
Additional information (if any)	Nil

ToR/EC Details:

Cost of project	4032.47Cr.
Total area of Project	316.63 Ha
Height of Dam from River Bed (EL)	Height of Embankment max-33 m & min-13 m
Length of Tunnel/Channel	218.41m
Details of Submergence area	174.68 Ha
Types of Waste and quantity of generation during construction/ Operation	Muck from excavation, solid waste from labour colony and construction waste
E-Flows for the Project	Not Applicable, as this is Off-Stream Closed Loop Pumped Storage Project (PSP)
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin. If not the E-Flows maintain criteria for sustaining river ecosystem.	No

Muck Management Details:

No. of proposed disposal area/ (type of land- Forest/Pvt. land)	One Location of 40 Ha in Forest Area
Muck Management Plan	Will be Provided in EIA/EMP report
Monitoring mechanism for Muck Disposal	Will be Provided in EIA/EMP report

Land Area Breakup:

Government land/Forest Land	180.19 Ha-Forest Land
Submergence area/Reservoir area	174.68 Ha-Upper & Lower reservoirs
Land required for project components	316.63 Ha- Total Land requirement
Additional information (if any)	136.45 Ha-Private Land

Presence of Environmentally Sensitive areas in the study area

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/No**	**Details of Certificate / letter/ Remarks**
Reserve Forest/Protected Forest Land	--	Nil
National Park	--	
Wildlife Sanctuary	---	

Court case details:

Court Case	Nil
Additional information (if any)	Nil

Affidavit/Undertaking details:

Affidavit/Undertaking	Enclosed
Additional information (if any)	Nil

Previous EC compliance and necessary approvals:

Particulars	**Letter no. and date**
Certified EC compliance report (if applicable)	Not Applicable
Status of Stage- I FC	Yet to Apply
Additional detail (If any)	Nil
Is FRA (2006) done for FC-I	Yet to Apply

Miscellaneous

Particulars	**Details**
Details of consultant	M/s. R S Envirolink Technologies Pvt.

	Ltd. (RSET) (*NABET* Accredited *Consultant Organization*) Certificate No : NABET/EIA/2225/RA0274 Validity : August 15, 2025
Project Benefits	• Pumped storage hydropower is a modified use of conventional hydropower technology to store and manage energy or electricity by moving water between an upper and lower reservoir. Currently, pumped storage round-trip or cycle energy efficiencies exceed 80%, comparing favorably to other energy storage technologies and thermal technologies. This effectively shifts, stores, and reuses energy generated until there is corresponding demand for system reserves and variable energy integration. This shifting can also occur to avoid transmission congestion periods, to help more efficiently manage transmission grid, and to avoid potential interruptions to energy supply. This is important because many of the renewable energy resources being developed (e.g., wind and solar) are generated at times of low demand and off-peak energy demand periods are still being met with fossil fuel resources, often at inefficient performance levels that increase the release of greenhouse gas emissions. • Further, pumped storage projects are critical to the national economy and overall energy reliability because it's: o Least expensive source of electricity, not requiring fossil fuel for generation o An emission-free renewable source o Balancing grid for demand driven variations o Balancing generation driven variations o Voltage support and grid stability • Apart from this, proposed PSP will also benefit the local community by creating employment opportunities

	and will result in upliftment of livelihood and socio-economic conditions.
Status of other statutory clearances	**Forest Clearance:** Online application seeking forest diversion for around 180.19 Ha after receipt of ToR Approval. Alongside, other statutory clearances (as applicable) from State as well as Central government will be obtained post completion of Detailed Project Report.
R&R details	Details shall be evaluated during EIA/EMP Studies
Additional detail (If any)	Nil

viii. Alternate Layouts: Three alternative layouts for this scheme were studied.

Alternative – 1: Layout with Surface Powerhouse and other components of this scheme are Site – 1 Upper reservoir, Intake structure, Penstock / Pressure Shaft, Tail Race Tunnel, Tail Race Outlet, Tail Race Channel and Site-1 Lower reservoir.

Alternative – 2: Layout with Surface Powerhouse and other components of this scheme are Site – 2 Upper reservoir, Intake structure, Penstock / Pressure Shaft, Surge Shaft, Tail Race Tunnel, Tail Race Outlet, Tail Race Channel and Site – 2 Lower reservoir.

Alternative – 3: Layout with Surface Powerhouse and other components of this scheme are Site – 2 Upper reservoir, Intake structure, Penstock / Pressure Shaft, Surge Shaft, Tail Race Tunnel, Tail Race Outlet, Tail Race Channel and Site – 1 Lower reservoir.

Selection of Final Layout

Alternative – 1 layout has been preferred considering the following reasons:

- The length of embankment of upper reservoir for Alternative -1 (i.e., 2700 m) is about 509m more than Alternative – 2 (i.e., 2191 m). But considering the maximum and weighted average height, in case of Alternative – 1, it is 33m & 13m respectively whereas in case of Alternative – 2, it is 58m and 30m respectively. Therefore, considering the increase in height of embankment in case of Alternative - 2, there will not be any increase in cost of embankment of upper reservoir in Alternative – 1.
- The length of embankment of lower reservoir for Alternative -1 (i.e., 2043 m) is about 704m less than Alternative – 2 & 3 (i.e., 2747 m). Hence, considerable cost and time will be reduced in Alternative – 1 layout.
- The length of Penstock in Alternative – 1 (i.e., 878.14m) is less than Alternative – 2 & 3 (i.e., 977m). Hence, cost and time will be reduced considerably.
- The lower reservoir of Alternative – 2 and 3 layout is coming under populated area and will create Social and Environmental issues. Where as in case of Alternative – 1 layout, no social and environmental issues are envisaged.
- The total area of land required for Alternative -1 layout (i.e., 316.63 Ha) is less than
- Alternative – 2 & 3 (i.e., 408.04 Ha and 380.25 Ha).

44.8.3 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of terms of reference to the project for Astha UP Off-Stream Closed Loop Pumped Storage project (640 MW) in an area of 316.63 Ha located at Village Katra and Sansarpur, Tehsil Lalgang and Koraon, District Mirzapur and Prayagraj (Uttar Pradesh) by M/s Astha Green Energy Ventures India Pvt. Ltd.

The project/activity is covered under Category A of item 1 (c) 'River Valley projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.

44.8.4 The EAC after detailed deliberation on the information submitted and as presented during the meeting ***recommended*** for grant of Standard ToR for conducting EIA study for Astha UP Off-Stream Closed Loop Pumped Storage project (640 MW) in an area of 316.63 Ha located at Village Katra and Sansarpur, Tehsil Lalgang and Koraon, District Mirzapur and Prayagraj (Uttar Pradesh) by M/s Astha Green Energy Ventures India Pvt. Ltd, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

[A] Environmental Management and Biodiversity Conservation:

i. Cumulative Impact of project on carrying capacity and sustainability of Reservoir/ nalahs of catchment area / due to tapping of water for filling reservoir.
ii. Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Standard ToR shall be collected for preparation of EIA/ EMP report along with soil characteristics which shall be studied at minimum 10 locations. The ground water level at 10 locations shall be measured in project area in all three seasons.
iii. A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted for power generation and thermal stratification. Accordingly, Environment Management plan shall be prepared.
iv. Sampling locations be located to cover villages situated near the reservoir and around boundary of forest area for collection of baseline data and data to be incorporated in EIA/ EMP report.
v. Identify the sand mining/ quarrying sites in submergence area and downstream of reservoir.
vi. Source of construction material and its distance from the project site along with detailed transportation plan for construction material.
vii. A detailed reclamation/ restoration plan of quarrying site/sites be incorporated in the EIA/EMP report.
viii. Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is located outside the Eco Sensitive Zone (ESZ).
ix. A detailed wildlife conservation plan for Schedule –I species be prepared duly approved by the Chief Wild Life Warden be submitted.
x. In case any Wildlife Corridor is located within 10 km radius of the project site a detailed study shall be conducted to assess the impact of project on safe movement of wild animals.
xi. Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.
xii. Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Govt. institutions/ Indian Council of Agriculture Research (ICAR)and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.

xiii. MoU for water uses for the project shall be signed and approved by concerned authority.
xiv. Environmental matrix during construction and operational phase needs to be submitted.
xv. Matrix formulated on the basis of detailed study and field survey of flora and Fauna methodology used shall be mentioned in the EIA report.
xvi. Endemic plant and animal species found in the area concerned shall be provided instead listing entire endemic species found in the State.
xvii. Details of Flora and Fauna reported in submergence area, Nos. of tree along with their density and nomenclature of the tree species required to be felled for reservoir creation and other project component.
xviii. Project impact on avi-fauna shall be studied and incorporated in EIA/ EMP report.
xix. Impact assessment on the fish diversity based on the hydrological alteration at the water drawing sources shall be studied.
xx. Stage-I Forest Clearance shall be obtained.
xxi. Study of impacts of project on water sources i.e. Belan Nadi.

[B] Socio-economic Study

xxii. Declaration by the project proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.
xxiii. All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/ EMP report in the relevant chapter.
xxiv. Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F.No.22- 65/2017- IA.III dated 30th September, 2020 shall be submitted.
xxv. Tentative no. of project affected families shall be identified and accordingly appropriate Rehabilitation & Resettlement plan shall be prepared.
xxvi. Details of settlement in 10 km area shall be submitted.

[C] Muck Management/ Disaster Management

xxvii. Details of quantity of muck generation component wise and disposal site along with transportation plan and its monitoring to be provided.
xxviii. Details of Muck Management plan prepared along with estimated cost incorporated in EIA/ EMP report.
xxix. Techno-economic viability of the project must be recommended from CEA/ CWC

[D] Miscellaneous.

xxx. Pre-DPR Chapters viz. Layout Map and Power Potential Studies duly approved by CWC/CEA shall be submitted.
xxxi. Undertaking need to submitted on affidavit that regarding no activities has been yet started on the project site and water allocated to this scheme shall not be diverted to other purpose.
xxxii. Both capital and recurring expenditure under EMP shall be submitted.
xxxiii. The photograph should bear the date, time, latitude & longitude of the monitoring station/ sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyse the samples.
xxxiv. Arial view video of project site shall be recorded and to be submitted.
xxxv. Detailed plan to restore wider roads and convert them into narrow upto 10m after construction of the project.

Agenda Item No. 44.9

Rewa Off-Stream Closed Loop Pumped Storage Project (600 MW) in an area of 449.47 Ha located at Village Dhakara No.2, Tehsil Teonthar, District Rewa (Madhya Pradesh) by M/s Sasa Stone Private Limited- Terms of Reference (TOR) - reg.

[Proposal No. IA/MP/RIV/422106/2023; F. No. J-12011/12/2023-IA.I (R)]

44.9.1: The proposal is for grant of Terms of Reference (TOR) for Rewa Off-Stream Closed Loop Pumped Storage Project (600 MW) in an area of 449.47 Ha located at Village Dhakara No.2, Tehsil Teonthar, District Rewa (Madhya Pradesh) by M/s Sasa Stone Private Limited.

44.9.2: The details of the project submitted by project proponent and ascertained from the document submitted are mentioned below:

i. M/s Sasa Stone Private Limited proposes to develop Rewa Pumped Storage Project envisaged as Off-Stream Closed Loop Pumped Storage project (OCPSP) of 600 MW / 3726 MWH storage capacity, located in Dhakara No.2 Village of Teonthar Tehsil in Rewa District, Madhya Pradesh.

ii. The Rewa PSP will comprise of two reservoirs which are to be constructed newly. The geographical co-ordinates of the proposed upper reservoir are at longitude 81°51'18.33"E and latitude is 24°49’15.67” N and that of lower reservoir are at longitude 81°51'20.59"E and latitude 24°50'40.47". Proposed rating of Pumped Storage Project is 600 MW.

iii. The upper reservoir is proposed to be located on natural depression which is suitable for creating the desired gross storage capacity of 0.326 TMC. Out of 0.326 TMC, the live storage capacity is 0.304 TMC and the dead storage capacity is 0.021 TMC by keeping FRL & MDDL at EL+308.00 m & EL+286.00 m respectively. For creating this storage, it is proposed to construct Rockfill embankment for the weighted average height of around 13m (with maximum height of 36m) for the length of 1290m.

iv. The lower reservoir is proposed to be located on the natural depression which is suitable for creating the desired gross storage capacity of 0.336 TMC by doing excavation up to the desired level. Out of 0.336 TMC, the live storage capacity is 0.306 TMC and dead storage capacity is 0.031 TMC by keeping FRL and MDDL at EL+118.00m & EL+109.00m respectively. For creating this storage, it is proposed to construct rockfill embankment for the weighted average height of 9 m (with maximum height of 16m) for the length of 2717.00 m.

v. It is proposed that One-time requirement of 0.357 TMC of water will be lifted from existing nearby Belan River (which is located about 13 Km away from the proposed lower reservoir) and will be stored in the lower reservoir to be constructed and used cyclically for energy storage and discharge. Evaporation losses of about 0.045 TMC of water will be recouped periodically from Belan River based on the requirement. This Project envisages non-consumptive reutilization of 0.304 TMC of water for recirculation among two proposed reservoirs.

vi. The Rewa Pumped Storage Project envisages construction of:

- Rock fill embankments of weighted average height of around 13 m with maximum of 36 m height in upper reservoir and weighted average height of around 9 m with maximum of 16 m in lower reservoir for creation of Rewa upper & lower reservoir with 0.304 & 0.306 TMC live storage capacity respectively.
- 30 wide and FSD of 5.0m Approach channel of 926.18 m long with the proposed upper reservoir

- 43.1 m high Power Intake Structure.
- 1 no. of 903.43 m long and 7.0m dia. circular steel lined Penstock / Pressure Shaft (i.e., consisting of 200.00 m long Intake Tunnel, 33.00 m long Surface Penstock-1, 137.56 m long vertical pressure shaft-1, 55.00 m long Horizontal pressure shaft-1, 98.44 m long Surface Penstock-2, 133.86 m long vertical pressure shaft-2 and 245.56 m long Horizontal pressure shaft-2 up to power house) to feed 1 unit of 300MW.
- Similarly, another one no. of 803.43 m long and 7.0m dia. circular steel lined Penstock / Pressure Shaft (i.e., consisting of 200.00 m long Intake Tunnel, 33.00 m long Surface Penstock-1, 137.56 m long vertical pressure shaft-1, 55.00 m long Horizontal pressure shaft-1, 98.44 m long Surface Penstock-2, 133.86 m long vertical pressure shaft-2 and 145.56 m long Horizontal pressure shaft-2 up to bifurcation point) which will get bifurcated in to near powerhouse each of 100m long of 4.9m dia. to feed 2 units of 150 MW each.
- A surface Powerhouse having an installation of One reversible Francis turbine of 300 MW capacity (Fixed speed turbine) and two reversible Francis turbine each of 150MW (Fixed speed turbine) operating under a rated head of 178.5 m in generating mode and 189.50 m in pumping mode.
- 3 nos. of Tail Race Tunnel of 193.09 m long (One no. of 7.5 m dia. for larger unit and Two nos. of 5.5 m dia. for smaller unit).
- 28.75 m high Outlet Structure.
- 25 wide and FSD of 5.0m Tail race channel of 356.30 m long joining with the proposed lower reservoir.

vii. The sailent features of the project are as under: -

Project details:

Name of the Proposal	Rewa Pumped Storage Project – Madhya Pradesh
Location (Including coordinates)	The proposed upper reservoir is at longitude 81°51'18.33" E and latitude is 24°49’15.67” N and that of lower reservoir are at longitude 81°51'20.59" E and latitude 24°50'40.47" N.
Inter- state issue involved	No
Seismic zone	Zone -II (least active)

Category details:

Category of the project	1(c) River Valley Projects
Provisions	
Capacity / Cultural command area (CCA)	600 MW
Attracts the General Conditions (Yes/No)	No
Additional information (if any)	Nil

Electricity generation capacity:

Powerhouse Installed Capacity	600 MW
Generation of Electricity Annually	1292 MU
No. of Units	3 Nos. (1 X 300 MW) + (2 X 150 MW)
Additional information (if any)	Nil

ToR/EC Details:

Cost of project	3759.32 Cr.
Total area required for the Project	449.47 Ha
Height of Dam from River Bed (EL)	Height of Embankment max-36 m & Avg-13 m
Length of Tunnel/Channel	3 nos, 193.09 m each
Details of Submergence area	279.60 Ha
Types of Waste and quantity of generation during construction/ Operation	Muck from excavation, solid waste from labour colony and construction waste
E-Flows for the Project	Not Applicable, as this is Pumped Storage Project (PSP)
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin. If not the E-Flows maintain criteria for sustaining river ecosystem.	No

Muck Management Details:

No. of proposed disposal area/ (type of land-Forest/Pvt. land)	Three Locations (2 nos of each 15 Ha and 1 no of 10 Ha) of 40 Ha (Non-Forest Area)
Muck Management Plan	Will be Provided in EIA/EMP report
Monitoring mechanism for Muck Disposal	Will be Provided in EIA/EMP report

Land Area Breakup:

Government land/Forest Land	320.94 Ha-Forest Land
Submergence area/Reservoir area	279.60 Ha-Upper & Lower reservoirs
Land required for project components	449.47 Ha- Total Land requirement
Additional information (if any)	128.53 Ha-of Non-Forest Land (which is included in total land requirement)

Presence of Environmentally Sensitive areas in the study area

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/No**	**Details of Certificate / letter/ Remarks**
Reserve Forest/Protected Forest Land	--	Nil
National Park	--- --	
Wildlife Sanctuary	--- --	

Court case details:

Court Case	Nil
Additional information (if any)	Nil

Affidavit/Undertaking details:

Affidavit/Undertaking	Enclosed
Additional information (if any)	Nil

Previous EC compliance and necessary approvals:

Particulars	Letter no. and date
Certified EC compliance report (if applicable)	Not Applicable
Status of Stage- I FC	Yet to Apply
Additional detail (If any)	Nil
Is FRA (2006) done for FC-I	Yet to Apply

Miscellaneous

Particulars	Details
Details of consultant	M/s R S Envirolink Technologies Pvt. Ltd. (RSET) (NABET Accredited Consultant Organization) Certificate No : NABET/EIA/2225/RA0274 Validity : 15.08.2025
Project Benefits	• Pumped storage power project is a modified use of conventional hydropower technology to store and manage energy or electricity by moving water between an upper and lower reservoir. Currently, pumped storage round-trip or cycle energy efficiencies exceed 80%, comparing favorably to other energy storage technologies and thermal technologies. This effectively shifts, stores, and reuses energy generated until there is corresponding demand for system reserves and variable energy integration. This shifting can also occur to avoid transmission congestion periods, to help more efficiently manage transmission grid, and to avoid potential interruptions to energy supply. This is important because many of the renewable energy resources being developed (e.g., wind and solar) are generated at times of low demand and off-peak energy demand periods are still

	being met with fossil fuel resources, often at inefficient performance levels that increase the release of greenhouse gas emissions. • Further, pumped storage projects are critical to the national economy and overall energy reliability because it's: o Least expensive source of electricity, not requiring fossil fuel for generation o An emission-free renewable source o Balancing grid for demand driven variations o Balancing generation driven variations o Voltage support and grid stability • Apart from this, proposed PSP will also benefit the local community by creating employment opportunities and will result in upliftment of livelihood and socio-economic conditions.
Status of other statutory clearances	**Forest Clearance:** Online application seeking forest diversion of about **320.94 Ha** will be submitted after receipt of ToR Approval. Alongside, other statutory clearances (as applicable) from State as well as Central government will be obtained post completion of Detailed Project Report.
R&R details	Details shall be evaluated during EIA/EMP Studies
Additional detail (If any)	Nil

viii. **Alternate Layouts: Three alternative layouts for this scheme were studied.**

Alternative – 1: Layout with Surface Powerhouse and other components of this scheme are Site – 1 Upper reservoir, Approach Channel, Intake structure, Penstock / Pressure Shaft, Tail Race Tunnel, Tail Race Outlet, Tail Race Channel and Site-1 Lower reservoir.

Alternative – 2: Layout with Surface Powerhouse and other components of this scheme are Site – 2 Upper reservoir, Approach Channel, Intake structure, Penstock / Pressure Shaft, Surge Shaft, Tail Race Tunnel, Tail Race Outlet, Tail Race Channel and Site – 2 Lower reservoir.

Alternative – 3: Layout with Surface Powerhouse and other components of this scheme are Site – 1 Upper reservoir, Approach Channel, Intake structure, Penstock / Pressure Shaft, Surge Shaft, Tail Race Tunnel, Tail Race Outlet, Tail Race Channel and Site – 2 Lower reservoir.

Selection of Final Layout

Alternative – 1 layout has been preferred considering the following reasons:

- The length of embankment of upper reservoir for Alternative -1 (i.e., 1290 m) is less than Alternative – 2 (i.e., 1555 m). Similarly, the length of embankment of lower reservoir for

Alternative – 1 (i.e., 2717 m) is less than Alternative -3 (i.e., 2845 m). Hence, cost and time will reduce to some extent in Alternative – 1 layout.

- The length of Penstock for Alternative – 1 is (i.e., 903.43 m) is less than Alternative – 2 (i.e., 2540 m). Hence, considerable cost and time can be reduced for Alternative – 1 layout. In addition, since the length of water conductor system is more and L/H ratio is also more than 6 in Alternative – 2, Surge shaft structure is required to be provided as an additional structure which will increase further the overall project cost considerably.
- The length of Tail Race Channel for Alternative -1 (i.e., 356.30 m) is less than Alternative – 3 (i.e., 1770 m). Hence considerable cost and time can be reduced in Alternative – 1 layout.
- On detailed assessment for Social and environmental aspects it was observed that few portions of the upper reservoir of Alternative - 2 is in populated area and also coming under cultivated area and major roads are connecting various villages. Keeping the reservoir in this location will cause disturbance and dislocation of number of populations, social and environmental issues. Whereas in case of Alternative – 1, the entire area of upper reservoir is in forest land and no social and environmental issues are envisaged.
- Similarly, on detailed assessment for Social and environmental aspects it was observed that few portions of the lower reservoir of Alternative - 3 is in populated area and also coming under cultivated area. Keeping the reservoir in this location may cause disturbance and dislocation of number of populations, social and
- environmental issues. Whereas in case of Alternative – 1, no social and environmental issues are envisaged as the reservoir is located far away from the habituated area.
- The total area of land required for Alternative – 1 (i.e., 449.47 Ha) is less than Alternative – 2 & 3 (i.e., 475.03 Ha & 471.00 Ha respectively).

44.9.3 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of terms of reference to the project for Rewa Off-Stream Closed Loop Pumped Storage Project (600 MW) in an area of 449.47 Ha located at Village Dhakara No.2, Tehsil Teonthar, District Rewa (Madhya Pradesh) by M/s Sasa Stone Private Limited.

The project/activity is covered under Category A of item 1 (c) 'River Valley projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.

44.9.4 The EAC after detailed deliberation on the information submitted and as presented during the meeting ***recommended*** for grant of Standard ToR for conducting EIA study for Rewa Off-Stream Closed Loop Pumped Storage Project (600 MW) in an area of 449.47 Ha located at Village Dhakara No.2, Tehsil Teonthar, District Rewa (Madhya Pradesh) by M/s Sasa Stone Private Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

[A] Environmental Management and Biodiversity Conservation:

i. Cumulative Impact of project on carrying capacity and sustainability of Reservoir/ nalahs of catchment area / due to tapping of water for filling reservoir due to presence of other proposed PSPs or hydroelectric project in close proximity of the project.

ii. Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Standard ToR shall be collected for preparation of EIA/ EMP report along with soil characteristics which shall be studied at

minimum 10 locations. The ground water level at 10 locations shall be measured in project area in all three seasons.

iii. A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted for power generation and thermal stratification. Accordingly, Environment Management plan shall be prepared.

iv. Sampling locations be located to cover villages situated near the reservoir and around boundary of forest area for collection of baseline data and data to be incorporated in EIA/ EMP report.

v. Identify the sand mining/ quarrying sites in submergence area and downstream of reservoir.

vi. Source of construction material and its distance from the project site along with detailed transportation plan for construction material.

vii. A detailed reclamation/ restoration plan of quarrying site/sites be incorporated in the EIA/EMP report.

viii. Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is located outside the Eco Sensitive Zone (ESZ).

ix. A detailed wildlife conservation plan for Schedule –I species be prepared duly approved by the Chief Wild Life Warden be submitted.

x. In case any Wildlife Corridor is located within 10 km radius of the project site a detailed study shall be conducted to assess the impact of project on safe movement of wild animals.

xi. Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.

xii. Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Govt. institutions/ Indian Council of Agriculture Research (ICAR)and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.

xiii. MoU for water uses for the project shall be signed and approved by concerned authority.

xiv. Environmental matrix during construction and operational phase needs to be submitted.

xv. Matrix formulated on the basis of detailed study and field survey of flora and Fauna methodology used shall be mentioned in the EIA report.

xvi. Endemic plant and animal species found in the area concerned shall be provided instead listing entire endemic species found in the State.

xvii. Details of Flora and Fauna reported in submergence area, Nos. of tree along with their density and nomenclature of the tree species required to be felled for reservoir creation and other project component.

xviii. Project impact on avi-fauna shall be studied and incorporated in EIA/ EMP report.

xix. Impact assessment on the fish diversity based on the hydrological alteration at the water drawing sources shall be studied.

xx. Stage-I Forest Clearance shall be obtained.

xxi. Study of impacts of project on water sources i.e. Belan River.

[B] Socio-economic Study

xxii. Declaration by the project proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.

xxiii. All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/ EMP report in the relevant chapter.

xxiv. Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F.No.22- 65/2017- IA.III dated 30th September, 2020 shall be submitted.

xxv. Tentative no. of project affected families shall be identified and accordingly appropriate Rehabilitation & Resettlement plan shall be prepared.
xxvi. Details of settlement in 10 km area shall be submitted.

[C] Muck Management/ Disaster Management

xxvii. Details of quantity of muck generation component wise and disposal site along with transportation plan and its monitoring to be provided.
xxviii. Details of Muck Management plan prepared along with estimated cost incorporated in EIA/ EMP report.
xxix. Techno-economic viability of the project must be recommended from CEA/ CWC

[D] Miscellaneous.

xxx. Pre-DPR Chapters viz. Layout Map and Power Potential Studies duly approved by CWC/CEA shall be submitted.
xxxi. Undertaking need to submitted on affidavit that regarding no activities has been yet started on the project site and water allocated to this scheme shall not be diverted to other purpose.
xxxii. Both capital and recurring expenditure under EMP shall be submitted.
xxxiii. The photograph should bear the date, time, latitude & longitude of the monitoring station/ sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyse the samples.
xxxiv. Arial view video of project site shall be recorded and to be submitted.
xxxv. Detailed plan to restore wider roads and convert them into narrow upto 10m after construction of the project.

Agenda Item No. 44.10

Sirohi Pumped Storage Project (640 MW) in an area of 311.99 Ha located at Village Chhibagaon, Tehsil Shivgang, District Sirohi (Rajasthan) by M/s Sasa Stone Private Limited- Terms of Reference (TOR) - reg.

[Proposal No. IA/RJ/RIV/422207/2023; F. No. J-12011/13/2023-IA.I (R)]

44.10.1: The proposal is for grant of Terms of Reference (TOR) for Sirohi Pumped Storage Project (640 MW) in an area of 311.99 Ha located at Village Chhibagaon, Tehsil Shivgang, District Sirohi (Rajasthan) by M/s Sasa Stone Private Limited.

44.10.2: The details of the project submitted by project proponent and ascertained from the document submitted are mentioned below:

i. M/s Sasa Stone Private Limited proposes to develop Sirohi Pumped Storage Project (PSP) of 640 MW / 3859 MWH storage capacity, located in Chhibagaon Village of Shivgang Tehsil in Sirohi District, Rajasthan.

ii. The Sirohi PSP will comprise of two reservoirs which are to be constructed newly. The geographical coordinates of the proposed upper reservoir are at longitude 72°57'28.89" E and latitude is 24°59'26.06" N and that of lower reservoir are at longitude 72°56'52.07" E and latitude 24°59'42.88" N. Proposed rating of Pumped Storage Project is 640 MW.

iii. The upper reservoir is proposed to be located on natural depression which is suitable for creating the desired gross storage capacity of 0.333 TMC by doing excavation up to the desired level.

Out of 0.333 TMC, the live storage capacity is 0.312 TMC and the dead storage capacity is 0.021 TMC by keeping FRL & MDDL at EL 525.00m & EL 505.00m respectively. For creating this storage, it is proposed to construct rockfill embankment for the weighted average height of around 16m (with maximum height of 38m) for the length of 2541 m.

iv. The lower reservoir is proposed to be located in the gorge portion which is suitable for creating the desired gross storage capacity of 0.381 TMC by doing excavation up to the desired level. Out of 0.381 TMC, the live storage capacity is 0.313 TMC and dead storage capacity is 0.068 TMC by keeping FRL and MDDL at EL 340.00m & EL 320.00m respectively. For creating this storage, it is proposed to construct rockfill embankment for the weighted average height of 21m (with maximum height of 38m) for the length of 857m.

v. One-time requirement of 0.402 TMC of water will be lifted from existing nearby Sukri Nadi tributary of Luni River (which is located about 3Km away from the proposed lower reservoir) and will be stored in the lower reservoir to be constructed and used cyclically for energy storage and discharge. Evaporation losses will be recouped periodically from Sukri Nadi. This Project envisages non-consumptive re-utilization of 0.312 TMC of water for recirculation among two proposed reservoirs.

vi. The Sirohi Pumped Storage Project envisages construction of

- Rock fill embankments of weighted average height of around 16m with maximum of 38m height in upper reservoir and weighted average height of around 21m with maximum of 38m in lower reservoir for creation of Sirohi upper & lower reservoir with 0.312 & 0.313 TMC live storage capacity respectively.
- 41.50m high Power Intake Structure
- 1 no. of 949.58m long and 7.0m dia. circular steel lined Penstock / Pressure Shaft (i.e., consisting of 304.48 m long Intake tunnel, 117.12m long surface penstock, 247.96m long vertical pressure shaft and 280.02m long Horizontal pressure shaft) to feed 1 unit of 320 MW.
- Similarly, another one no. of 849.58m long 7.0m dia. circular steel lined Penstock / ressure Shaft (i.e., consisting of 304.48 m long Intake tunnel, 117.12m long surface penstock, 247.96m long vertical pressure shaft and 180.02m long Horizontal pressure shaft up to bifurcation point) which will get bifurcated into 2 nos. near power house each of 100 m long and 4.9m dia. to feed 2 units of 160MW.
- A surface Powerhouse having an installation of One reversible Francis turbine of 320 MW capacity (Fixed speed turbine) and two reversible Francis turbine each of 160MW (both are Fixed speed turbines) operating under a rated head of 180 m in generating mode and 191 m in pumping mode.

vii. The sailent features of the project are as under: -

Project details:

Name of the Proposal	Sasa Stone Private Limited Sirohi Pumped Storage Project – Rajasthan
Location (Including coordinates)	The proposed project involves creation of Upper Reservoir 24°59'26.06" N & 72°57'28.89" E Lower Reservoir

	24°59'42.88" N & 72°56'52.07" E
Inter- state issue involved	No
Seismic zone	Zone -II

Category details:

Category of the project	1(c) River Valley Projects
Provisions	
Capacity / Cultural command area (CCA)	640 MW
Attracts the General Conditions (Yes/No)	No
Additional information (if any)	Nil

Electricity generation capacity:

Powerhouse Installed Capacity	640 MW (3859 MWH)
Generation of Electricity Annually	1337 MU
No. of Units	3 Nos. (1 X 320 MW) + (2 X 160 MW)
Additional information (if any)	Nil

ToR/EC Details:

Cost of project	4089.50 Cr.
Total area of Project	322.16 Ha
Height of Dam from River Bed (EL)	Rock fill embankments of weighted average height of around 16m with maximum of 38m height in upper reservoir and weighted average height of around 21m with maximum of 38m in lower reservoir
Length of Tunnel/Channel	304.48 m
Details of Submergence area	191.91 Ha
Types of Waste and quantity of generation during construction/ Operation	Muck from excavation, solid waste from labour colony and construction waste
E-Flows for the Project	Not Applicable, as this is Pumped Storage Project (PSP)
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin. If not the E-Flows maintain criteria for sustaining river ecosystem.	No

Muck Management Details:

No. of proposed disposal area/ (type of land- Forest/Pvt. land)	One Location of 40 Ha in Non-Forest Area
Muck Management Plan	Will be Provided in EIA/EMP report
Monitoring mechanism for Muck Disposal	Will be Provided in EIA/EMP report

Land Area Breakup:

Government land/Forest Land	233.86 Ha - Forest Land
Submergence area/Reservoir area	191.91 Ha-Upper & Lower reservoirs
Land required for project components	322.16 Ha- Total Land requirement
Additional information (if any)	88.30 Ha - Non-Forest Land

Presence of Environmentally Sensitive areas in the study area

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/No**	**Details of Certificate / letter/ Remarks**
Reserve Forest/Protected Forest Land	--	Nil
National Park	--	
Wildlife Sanctuary	--	

Court case details:

Court Case	Nil
Additional information (if any)	Nil

Affidavit/Undertaking details:

Affidavit/Undertaking	Enclosed
Additional information (if any)	Nil

Previous EC compliance and necessary approvals:

Particulars	**Letter no. and date**
Certified EC compliance report (if applicable)	Not Applicable
Status of Stage- I FC	Yet to Apply
Additional detail (If any)	Nil
Is FRA (2006) done for FC-I	Yet to Apply

Miscellaneous

Particulars	**Details**
Details of consultant	M/s R S Envirolink Technologies Pvt. Ltd. (RSET) (NABET Accredited Consultant Organization)

	Certificate No : NABET/EIA/2225/RA0274 Validity : August 15, 2025
Project Benefits	• Pumped storage power project is a modified use of conventional hydropower technology to store and manage energy or electricity by moving water between an upper and lower reservoir. Currently, pumped storage round-trip or cycle energy efficiencies exceed 80%, comparing favorably to other energy storage technologies and thermal technologies. This effectively shifts, stores, and reuses energy generated until there is corresponding demand for system reserves and variable energy integration. This shifting can also occur to avoid transmission congestion periods, to help more efficiently manage transmission grid, and to avoid potential interruptions to energy supply. This is important because many of the renewable energy resources being developed (e.g., wind and solar) are generated at times of low demand and off-peak energy demand periods are still being met with fossil fuel resources, often at inefficient performance levels that increase the release of greenhouse gas emissions. • Further, pumped storage projects are critical to the national economy and overall energy reliability because it's: o Least expensive source of electricity, not requiring fossil fuel for generation o An emission-free renewable source o Balancing grid for demand driven variations o Balancing generation driven variations o Voltage support and grid stability Apart from this, proposed PSP will also benefit the local community by creating employment opportunities and will result in upliftment of livelihood and socio-economic conditions.
Status of other statutory clearances	Forest Clearance: Online application seeking forest diversion for around

	233.86 Ha after receipt of ToR Approval. Alongside, other statutory clearances (as applicable) from State as well as Central government will be obtained post completion of Detailed Project Report.
R&R details	Details shall be evaluated during EIA/EMP Studies
Additional detail (If any)	Nil

viii. Alternate Layouts: Three alternative layouts for this scheme were studied.

Alternative – 1: Layout with Surface Powerhouse and other components of this scheme are Site – 1 Upper reservoir, Intake structure, Penstock / Pressure Shaft, Tail Race Outlet, Tail Race Channel and Site-1 Lower reservoir.

Alternative – 2: Layout with Surface Powerhouse and other components of this scheme are Site – 2 Upper reservoir, Intake structure, Penstock / Pressure Shaft, Surge Shaft, Tail Race Tunnel, Tail Race Outlet, Tail Race Channel and Site – 2 Lower reservoir.

Alternative – 3: Layout with Surface Powerhouse and other components of this scheme are Site – 1 Upper reservoir, Intake structure, Penstock / Pressure Shaft, Surge Shaft, Tail Race Outlet, Tail Race Channel and Site – 2 Lower reservoir.

Selection of Final Layout
Alternative – 1 layout has been preferred considering the following reasons:

- The length of embankment of upper reservoir for Alternative -1 (i.e., 2541 m) is less than Alternative – 2 (i.e., 4162 m). Hence, considerable cost and time can be reduced for Alternative – 1 layout.
- Similarly, the length of embankment of lower reservoir for Alternative -1 (i.e., 857 m) is less than Alternative – 3 (i.e., 2490 m). Hence, considerable cost and time can be reduced for Alternative – 1 layout.
- No Social and Environmental issues are envisaged in case of Alternative – 1 layout whereas in case of Alternative – 2 layout, upper reservoir is located in habituated and cultivation area and also multiple roads are existing which are connecting various places which will create social and Environmental issues. Similarly, in Alternative – 3 layout also, the lower reservoir location is located in major cultivated land, temple, existing road and few houses which will create social and environmental issues.
- The length of Penstock for Alternative -1 (i.e., 949.58 m) is less than Alternative – 2 i.e., 1593 m) which will increase Penstock cost and construction time considerably. In addition, since the length of water conductor system between intake and power house is more than Alternative – 1 and the L/H ratio is also more than 6, Surge shaft structure is required to be provided as an additional structure which will increase further the overall project cost considerably.
- Similarly, the length of Penstock for Alternative -1 (i.e., 949.58 m) is less than Alternative – 3 (i.e., 1075 m) which will increase Penstock cost to some extent.
- The length of Tail Race Channel is very less in Alternative – 1 layout (i.e., 35m) where s in case of Alternative – 3 layout, it is 1883m which will increase the project cost and construction time considerably.
- The area of land required for Alternative – 1 is (i.e., 322.16 Ha) less than Alternative – 2 & 3 (i.e., 785.28 Ha & 461.93 Ha respectively).

- The area of forest land required for Alternative – 1 is (i.e., 233.86 Ha) less than Alternative – 2 & 3 (i.e., 432.30 Ha & 300.67 Ha respectively).

44.10.3 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of terms of reference to the project for Sirohi Pumped Storage Project (640 MW) in an area of 311.99 Ha located at Village Chhibagaon, Tehsil Shivgang, District Sirohi (Rajasthan) by M/s Sasa Stone Private Limited.

The project/activity is covered under Category A of item 1 (c) 'River Valley projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.

44.10.4 The EAC after detailed deliberation on the information submitted and as presented during the meeting ***recommended*** for grant of Standard ToR for conducting EIA study for Sirohi Pumped Storage Project (640 MW) in an area of 311.99 Ha located at Village Chhibagaon, Tehsil Shivgang, District Sirohi (Rajasthan) by M/s Sasa Stone Private Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

[A] Environmental Management and Biodiversity Conservation:

i. Cumulative Impact of project on carrying capacity and sustainability of river/Reservoir/ nalahs of catchment area / due to tapping of water for filling the reservoir.
ii. Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Standard ToR shall be collected for preparation of EIA/ EMP report along with soil characteristics which shall be studied at minimum 10 locations. The ground water level at 10 locations shall be measured in project area in all three seasons.
iii. A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted for power generation and thermal stratification. Accordingly, Environment Management plan shall be prepared.
iv. Sampling locations be located to cover villages situated near the reservoir and around boundary of forest area for collection of baseline data and data to be incorporated in EIA/ EMP report.
v. Identify the sand mining/ quarrying sites in submergence area and downstream of reservoir.
vi. Source of construction material and its distance from the project site along with detailed transportation plan for construction material.
vii. A detailed reclamation/ restoration plan of quarrying site/sites be incorporated in the EIA/EMP report.
viii. Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is located outside the Eco Sensitive Zone (ESZ).
ix. A detailed wildlife conservation plan for Schedule –I species be prepared duly approved by the Chief Wild Life Warden be submitted.
x. In case any Wildlife Corridor is located within 10 km radius of the project site a detailed study shall be conducted to assess the impact of project on safe movement of wild animals.
xi. Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.
xii. Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Govt. institutions/ Indian Council of Agriculture Research (ICAR)and

accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.

xiii. MoU for water uses for the project shall be signed and approved by concerned authority.

xiv. Environmental matrix during construction and operational phase needs to be submitted.

xv. Matrix formulated on the basis of detailed study and field survey of flora and Fauna methodology used shall be mentioned in the EIA report.

xvi. Endemic plant and animal species found in the area concerned shall be provided instead listing entire endemic species found in the State.

xvii. Details of Flora and Fauna reported in submergence area, Nos. of tree along with their density and nomenclature of the tree species required to be felled for reservoir creation and other project component.

xviii. Project impact on avi-fauna shall be studied and incorporated in EIA/ EMP report.

xix. Impact assessment on the fish diversity based on the hydrological alteration at the water drawing sources shall be studied.

xx. Stage-I Forest Clearance shall be obtained.

xxi. Study of impacts of project on water sources i.e. Sukri Nadi.

[B] Socio-economic Study

xxii. Declaration by the project proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.

xxiii. All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/ EMP report in the relevant chapter.

xxiv. Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F.No.22- 65/2017- IA.III dated 30th September, 2020 shall be submitted.

xxv. Tentative no. of project affected families shall be identified and accordingly appropriate Rehabilitation & Resettlement plan shall be prepared.

xxvi. Details of settlement in 10 km area shall be submitted.

[C] Muck Management/ Disaster Management

xxvii. Details of quantity of muck generation component wise and disposal site along with transportation plan and its monitoring to be provided.

xxviii. Details of Muck Management plan prepared along with estimated cost incorporated in EIA/ EMP report.

xxix. Techno-economic viability of the project must be recommended from CEA/ CWC

[D] Miscellaneous.

xxx. Pre-DPR Chapters viz. Layout Map and Power Potential Studies duly approved by CWC/CEA shall be submitted.

xxxi. Undertaking need to submitted on affidavit that regarding no activities has been yet started on the project site and water allocated to this scheme shall not be diverted to other purpose.

xxxii. Both capital and recurring expenditure under EMP shall be submitted.

xxxiii. The photograph should bear the date, time, latitude & longitude of the monitoring station/ sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyse the samples.

xxxiv. Arial view video of project site shall be recorded and to be submitted.

xxxv. Detailed plan to restore wider roads and convert them into narrow upto 10m after construction of the project.

Agenda Item No. 44.11

MP Off-Stream Closed Loop Pumped Storage Project (600 MW) in an area of 438.36 Ha located at Village Bhasuda, Tehsil Ajaigarh, District Panna (Madhya Pradesh) by M/s Rithwik Projects Private Limited - Terms of Reference (TOR) - reg.

[Proposal No. IA/MP/RIV/422054/2023; F. No. J-12011/11/2023-IA.I (R)]

44.11.1: The proposal is for grant of Terms of Reference (TOR) for MP Off-Stream Closed Loop Pumped Storage Project (600 MW) in an area of 438.36 Ha located at Village Bhasuda, Tehsil Ajaigarh, District Panna (Madhya Pradesh) by M/s Rithwik Projects Private Limited.

44.11.2: The details of the project submitted by project proponent and ascertained from the document submitted are mentioned below:

i. M/s Rithwik Projects Private Limited proposes to develop MP Pumped Storage Project envisaged as Off-Stream Closed Loop Pumped storage project (OCPSP) of 600 MW / 3798 MWH storage capacity, located in Bhasuda village in Ajaigarh Tehsil of Panna District, Madhya Pradesh State.

ii. The MP PSP will comprise of two reservoirs which are to be constructed newly. The geographical co-ordinates of the proposed upper reservoir are at longitude 80°18'18.79" E and latitude is 24°49'30.98"N and that of lower reservoir are at longitude 80°19'4.40" E and latitude 24°50'58.22" N.

iii. The upper reservoir is proposed to be located on natural depression which is suitable for creating the desired gross storage capacity of 0.383 TMC by doing excavation up to the desired level. Out of 0.383 TMC, the live storage capacity is 0.359 TMC and the dead storage capacity is 0.023 TMC by keeping FRL & MDDL at EL 388.00m & EL 375.00m respectively. For creating this storage, it is proposed to construct rockfill embankment for the weighted average height of around 13m (with maximum height of 26m) for the length of 1738 m.

iv. The lower reservoir is proposed to be located in gorge portion which is suitable for creating the desired gross storage capacity of 0.398 TMC. Out of 0.398 TMC, the live storage capacity is 0.350 TMC and dead storage capacity is 0.048 MC by keeping FRL and MDDL at EL 228.00m & EL 209.00m respectively. For creating this storage, it is proposed to construct rockfill embankment for the weighted average height of 24m (with maximum height of 31m) for the length of 1268 m.

v. It is proposed that One-time requirement of 0.421 TMC of water will be lifted either from existing nearby Ken River tributary of Yamuna River (which is located about 21 Km away from the proposed lower reservoir) Or from Ranj River (which is located at about 3 Km away from the proposed Lower reservoir) and will be stored in the lower reservoir to be constructed and used cyclically for energy storage and discharge. Evaporation losses will be recouped periodically either from nearby Ken River tributary of Yamuna River or from Ranj River based on the requirement. This Project envisages non-consumptive re-utilization of 0.350 TMC of water for recirculation among two proposed reservoirs.

vi. The MP Pumped Storage Project envisages construction of:

- Rock fill embankments of weighted average height of around 13m with maximum of 26m height in upper reservoir and weighted average height of around 24m with maximum of 31m in lower reservoir for creation of MP upper & lower reservoir with 0.359 TMC & 0.350 TMC live storage capacity respectively.
- 35m wide and FSD of 5.0m Approach Channel of 1567.51 m long joining with the intake structure.
- 34.75 m high Power Intake Structure.
- 1 no. of 855.11 m long and 7.5 m dia. circular steel lined Penstock / Pressure Shaft (i.e., consisting of 127.95 m long Intake Tunnel, 312.34 m long Surface Penstock, 164.80 m long vertical pressure shaft, 250 m long Horizontal pressure shaft up to power house) to feed 1 unit of 300MW.
- Similarly, another one no. of 755.11 m long and 7.5 m dia. circular steel lined Penstock / Pressure Shaft (i.e., consisting of 127.95 m long Intake Tunnel, 312.34 m long Surface Penstock, 164.80 m long vertical pressure shaft, 150 m long Horizontal pressure shaft up to bifurcation point) which will get bifurcated into 2 nos. near powerhouse each of 100m long and 5.3m dia. to feed 2 units of 150MW each.
- A surface Powerhouse having an installation of One reversible Francis' turbine of 300 MW capacity (Fixed speed turbine) and two reversible Francis turbine each of 150MW (both are Fixed speed turbines) operating under a rated head of 158 m in generating mode and 169 m in pumping mode.
- 30m wide and FSD of 5.0m Tail race channel of 238.76m long joining with the proposed lower reservoir.

vii. The sailent features of the project are as under: -

Project details:

Name of the Proposal	MP Pumped Storage Project (600 MW) - Madhya Pradesh
Location (Including coordinates)	The proposed project involves creation of Upper reservoir (24°49'30.98"N, 80°18'18.79" E) and Lower reservoir (24°50'58.22" N, 80°19'4.40" E)
Inter- state issue involved	No
Seismic zone	Zone -II

Category details:

Category of the project	1(c) River Valley Projects
Provisions	
Capacity / Cultural command area (CCA)	600 MW
Attracts the General Conditions (Yes/No)	Yes
Additional information (if any)	Nil

Electricity generation capacity:

Powerhouse Installed Capacity	600 MW
Generation of Electricity Annually	1317 MU
No. of Units	3 Nos. (1 X 300 MW) + (2 X 150 MW)

Additional information (if any)	Nil

ToR/EC Details:

Cost of project	3961.44 Cr.
Total area of Project	438.36 Ha
Height of Dam from River Bed (EL)	UR with rockfill embankment for the weighted average height of around 13m (with maximum height of 26m) & LR with rockfill embankment for the weighted average height of 24m (with maximum height of 31m)
Length of Tunnel/Channel	127.95 m
Details of Submergence area	250.55 Ha
Types of Waste and quantity of generation during construction/ Operation	Muck from excavation, solid waste from labour colony and construction waste
E-Flows for the Project	Not Applicable, as this is Off-Stream Closed Loop Pumped Storage Project (PSP)
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin. If not the E-Flows maintain criteria for sustaining river ecosystem.	No

Muck Management Details:

No. of proposed disposal area/ (type of land-Forest/Pvt. land)	Two Locations of 40 Ha (30 Ha +10 Ha) in Non - Forest Area
Muck Management Plan	Will be Provided in EIA/EMP report
Monitoring mechanism for Muck Disposal	Will be Provided in EIA/EMP report

Land Area Breakup:

Government land/Forest Land	328.53 Ha-Forest Land
Submergence area/Reservoir area	250.55Ha -Upper & Lower reservoirs
Land required for project components	438.36 Ha- Total Land requirement
Additional information (if any)	109.83 Ha-Private Land

Presence of Environmentally Sensitive areas in the study area

Forest Land/ Protected Area/ Environmental Sensitivity Zone	Yes/No	Detailsof Certificate / letter/ Remarks
Reserve Forest/Protected Forest Land	--	Nearest PA is Panna Tiger Reserve, pipeline alignment is at a distance of 2.2 Km from the boundary of buffer zone and 18 km from the Core Zone.
National Park	yes	
Wildlife Sanctuary	yes	

Court case details:

Court Case	Nil
Additional information (if any)	Nil

Affidavit/Undertaking details:

Affidavit/Undertaking	Enclosed
Additional information (if any)	Nil

Previous EC compliance and necessary approvals:

Particulars	Letter no. and date
Certified EC compliance report (if applicable)	Not Applicable
Status of Stage- I FC	Yet to Apply
Additional detail (If any)	Nil
Is FRA (2006) done for FC-I	Yet to Apply

Miscellaneous

Particulars	Details
Details of consultant	M/s. R S Envirolink Technologies Pvt. Ltd. (RSET) (*NABET* Accredited *Consultant Organization*) Certificate No : NABET/EIA/2225/RA0274 Validity : August 15, 2025
Project Benefits	• Pumped storage power project is a modified use of conventional hydropower technology to store and manage energy or electricity by moving water between an upper and lower reservoir. Currently, pumped storage round-trip or cycle energy efficiencies exceed 80%, comparing favorably to other energy storage technologies and thermal technologies. This effectively shifts, stores, and reuses energy generated until there is corresponding demand for system reserves and variable energy integration. This shifting can also occur to avoid transmission congestion periods, to help

	more efficiently manage transmission grid, and to avoid potential interruptions to energy supply. This is important because many of the renewable energy resources being developed (e.g., wind and solar) are generated at times of low demand and off-peak energy demand periods are still being met with fossil fuel resources, often at inefficient performance levels that increase the release of greenhouse gas emissions. • Further, pumped storage projects are critical to the national economy and overall energy reliability because it's: o Least expensive source of electricity, not requiring fossil fuel for generation o An emission-free renewable source o Balancing grid for demand driven variations o Balancing generation driven variations o Voltage support and grid stability • Apart from this, proposed PSP will also benefit the local community by creating employment opportunities and will result in upliftment of livelihood and socio-economic conditions.
Status of other statutory clearances	Forest Clearance: Online application seeking forest diversion for around 328.53 Ha after receipt of ToR Approval. Alongside, other statutory clearances (as applicable) from State as well as Central government will be obtained post completion of Detailed Project Report.
R&R details	Details shall be evaluated during EIA/EMP Studies.
Additional detail (If any)	Nil

viii. Alternate Layouts: Three alternative layouts for this scheme were studied.

Alternative – 1: Layout with Surface Powerhouse and other components of this scheme are Site – 1 Upper reservoir, Intake structure, Penstock / Pressure Shaft, Tail Race Outlet, Tail Race Channel and Site-1 Lower reservoir.

Alternative – 2: Layout with Surface Powerhouse and other components of this scheme are Site – 2 Upper reservoir, Intake structure, Penstock / Pressure Shaft, l, Tail Race Outlet, Tail Race Channel and Site – 1 Lower reservoir.

Alternative – 3: Layout with Surface Powerhouse and other components of this scheme are Site – 1 Upper reservoir, Intake structure, Penstock / Pressure Shaft, Tail Race Outlet, Tail Race Channel and Site –21 Lower reservoir.

Selection of Final Layout

Alternative – 1 layout has been preferred considering the following reasons:

- The length of embankment of upper reservoir for Alternative -1 (i.e., 1738 m) is less than Alternative – 2 (i.e., 3081 m). Hence, considerable cost and time can be reduced for Alternative – 1 layout.
- The length of embankment of lower reservoir for Alternative -1 (i.e., 1268 m) is less than Alternative – 3 (i.e., 2387 m). Hence, considerable cost and time can be reduced for Alternative – 1 layout.
- The length of Penstock / Pressure Shaft in Alternative – 1 layout is (i.e., 855.11m) is less than Alternative – 3 (i.e., 1099m). Hence, cost and time can be reduced to some extent in Alternative – 1 layout.
- The depth of excavation required for Power house in Alternative – 1 (i.e., 115.50m) is less than Alternative – 2 (i.e., 140.50m) and Alternative – 3 (i.e., 125.50m).
- No Social and Environmental issues are envisaged in case of Alternative – 1 layout whereas in case of Alternative – 2 layout, upper reservoir is located in habituated and cultivation area and also few roads are existing which are connecting various places which will create social and Environmental issues.
- Similarly, in case of Alternative – 3 layout also, few houses, major cultivation land and Ranj River are coming under the lower reservoir area. Displacement of People and diversion of Ranj river will create Social and Environmental issues.
- The total area of land required for Alternative – 1 (i.e., 438.36 Ha) is less than Alternative – 2 (i.e., 493.26 Ha) and Alternative – 3 (i.e., 453.98 Ha).
- The area of forest land required for Alternative – 1 (i.e., 328.53 Ha) is less than Alternative – 2 (i.e., 341.42 Ha).

44.11.3 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of terms of reference to the project for MP Off-Stream Closed Loop Pumped Storage Project (600 MW) in an area of 438.36 Ha located at Village Bhasuda, Tehsil Ajaigarh, District Panna (Madhya Pradesh) by M/s Rithwik Projects Private Limited.

The project/activity is covered under Category A of item 1 (c) 'River Valley projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.

44.11.4 The EAC after detailed deliberation on the information submitted and as presented during the meeting ***recommended*** for grant of Standard ToR for conducting EIA study for MP Off-Stream Closed Loop Pumped Storage Project (600 MW) in an area of 438.36 Ha located at Village Bhasuda, Tehsil Ajaigarh, District Panna (Madhya Pradesh) by M/s Rithwik Projects Private Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

[A] Environmental Management and Biodiversity Conservation:

i. Cumulative Impact of project on carrying capacity and sustainability of Reservoir/ nalahs of catchment area / due to tapping of water for filling reservoir.

ii. Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Standard ToR shall be collected for preparation of EIA/ EMP report along with soil characteristics which shall be studied at

minimum 10 locations. The ground water level at 10 locations shall be measured in project area in all three seasons.

iii. A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted for power generation and thermal stratification. Accordingly, Environment Management plan shall be prepared.

iv. Sampling locations be located to cover villages situated near the reservoir and around boundary of forest area for collection of baseline data and data to be incorporated in EIA/ EMP report.

v. Identify the sand mining/ quarrying sites in submergence area and downstream of reservoir.

vi. Source of construction material and its distance from the project site along with detailed transportation plan for construction material.

vii. A detailed reclamation/ restoration plan of quarrying site/sites be incorporated in the EIA/EMP report.

viii. Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is located outside the Eco Sensitive Zone (ESZ) of Panna Tiger Reserve.

ix. A detailed wildlife conservation plan for Schedule –I species be prepared duly approved by the Chief Wild Life Warden be submitted.

x. In case any Wildlife Corridor is located within 10 km radius of the project site a detailed study shall be conducted to assess the impact of project on safe movement of wild animals.

xi. Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.

xii. Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Govt. institutions/ Indian Council of Agriculture Research (ICAR)and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.

xiii. MoU for water uses for the project shall be signed and approved by concerned authority.

xiv. Environmental matrix during construction and operational phase needs to be submitted.

xv. Matrix formulated on the basis of detailed study and field survey of flora and Fauna methodology used shall be mentioned in the EIA report.

xvi. Endemic plant and animal species found in the area concerned shall be provided instead listing entire endemic species found in the State.

xvii. Details of Flora and Fauna reported in submergence area, Nos. of tree along with their density and nomenclature of the tree species required to be felled for reservoir creation and other project component.

xviii. Project impact on avi-fauna shall be studied and incorporated in EIA/ EMP report.

xix. Impact assessment on the fish diversity based on the hydrological alteration at the water drawing sources shall be studied.

xx. Stage-I Forest Clearance shall be obtained.

xxi. Study of impacts of project on water sources i.e. Ken River.

[B] Socio-economic Study

xxii. Declaration by the project proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.

xxiii. All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/ EMP report in the relevant chapter.

xxiv. Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F.No.22- 65/2017- IA.III dated 30th September, 2020 shall be submitted.

xxv. Tentative no. of project affected families shall be identified and accordingly appropriate Rehabilitation & Resettlement plan shall be prepared.
xxvi. Details of settlement in 10 km area shall be submitted.

[C] Muck Management/ Disaster Management

xxvii. Details of quantity of muck generation component wise and disposal site along with transportation plan and its monitoring to be provided.
xxviii. Details of Muck Management plan prepared along with estimated cost incorporated in EIA/ EMP report.
xxix. Techno-economic viability of the project must be recommended from CEA/ CWC

[D] Miscellaneous.

xxx. Pre-DPR Chapters viz. Layout Map and Power Potential Studies duly approved by CWC/CEA shall be submitted.
xxxi. Undertaking need to submitted on affidavit that regarding no activities has been yet started on the project site and water allocated to this scheme shall not be diverted to other purpose.
xxxii. Both capital and recurring expenditure under EMP shall be submitted.
xxxiii. The photograph should bear the date, time, latitude & longitude of the monitoring station/ sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyse the samples.
xxxiv. Arial view video of project site shall be recorded and to be submitted.
xxxv. Detailed plan to restore wider roads and convert them into narrow upto 10m after construction of the project.

Agenda Item No. 44.12

Kolhapur Off-Stream Closed Loop Pumped Storage Project (1200 MW) in an area of 390.95 Ha located at Village Dhamapura, Kanu BK, Tehsil Chandgad, District Kolhapur (Maharashtra) by M/s Rithwik Projects Private Limited- Terms of Reference (TOR) - reg.

[Proposal No. IA/MH/RIV/422207/2023; F. No. J-12011/14/2023-IA.I (R)]

44.12.1: The proposal is for grant of Terms of Reference (TOR) for Kolhapur Off-Stream Closed Loop Pumped Storage Project (1200 MW) in an area of 390.95 Ha located at Village Dhamapura, Kanu BK, Tehsil Chandgad, District Kolhapur (Maharashtra) by M/s Rithwik Projects Private Limited.

44.12.2: The details of the project submitted by project proponent and ascertained from the document submitted are mentioned below:

i. M/s Rithwik Projects Private Limited proposes to develop Kolhapur Pumped Storage Project envisaged as Off-Stream Closed Loop Pumped Storage project (OCPSP) of 1200 MW / 7248 MWH storage capacity located near Dhamapura, Kanu BK Village of Chandgad Tehsil in Kolhapur District, Maharashtra.

ii. The Kolhapur OCPSP will comprise of two reservoirs which are to be constructed newly. The geographical co-ordinates of the proposed upper reservoir are at longitude 74° 6'5.43"E and latitude is 16° 0'48.32"N and that of lower reservoir are at longitude 74° 7'13.12"E and latitude 16° 0'21.26"N.

iii. The upper reservoir is proposed to be located on natural depression which is suitable for creating the desired gross storage capacity of 0.663 TMC by doing excavation up to the desired level. Out of 0.663 TMC, the live storage capacity is 0.505 TMC and the dead storage capacity is 0.158 TMC by keeping FRL & MDDL at EL 1000.00 m & EL 980.00 m respectively. For creating this storage, it is proposed to construct rockfill embankment for the weighted average height of around 22 m (with maximum height of 43 m) for the length of 1506.00 m.

iv. The lower reservoir is proposed to be located on the natural depression which is suitable for creating the desired gross storage capacity of 0.607 TMC by doing excavation up to the desired level. Out of 0.607 TMC, the live storage capacity is 0.509 TMC and dead storage capacity is 0.098 TMC by keeping FRL and MDDL at EL 790.00 m & EL 762.00m respectively. For creating this storage, it is proposed to construct rockfill embankment for the weighted average height of 36 m (with maximum height of 53m) for the length of 1502 m.

v. It is proposed that One-time requirement of 0.765 TMC of water will be lifted from existing nearby Ghatprabha River (which is located about 4 Km away from the proposed lower reservoir) and will be stored in the lower reservoir to be constructed and used cyclically for energy storage and discharge. Evaporation losses of about 0.08 TMC of water will be recouped periodically from Ghatprabha River based on the requirement. This Project envisages non-consumptive reutilization of 0.505 TMC of water for recirculation among two proposed reservoirs.

vi. The Kolhapur Off-Stream Closed Loop Pumped Storage Project envisages construction of

- Rock fill embankments of weighted average height of around 22 m with maximum of 43 m height in upper reservoir and weighted average height of around 36 m with maximum of 53 m in lower reservoir for creation of Kolhapur upper & lower reservoir with 0.505 & 0.509 TMC live storage capacity respectively.
- 40.15 m high Power Intake Structure.
- 3 no. of 1250.07m long and 6.5 m dia. circular steel lined Penstock / Pressure Shaft (i.e., consisting of 139.29 m long Intake Tunnel, 807.62 m long Surface Penstock, 51.76 m long vertical pressure shaft, 151.40 m long Horizontal pressure shaft up to power house) to feed 3 units of 300MW each.
- Similarly, another one no. of 1250.07m long and 6.5 m dia. circular steel lined Penstock / Pressure Shaft (i.e., consisting of 139.29 m long Intake Tunnel, 807.62 m long Surface Penstock, 151.76 m long vertical pressure shaft, 51.40 m long Horizontal pressure shaft up to bifurcation point) which will get bifurcated into 2 nos. near powerhouse each of 100 m long and 4.6 m dia. to feed 2 units of 150MW each.
- A surface Powerhouse having an installation of Three reversible Francis turbine of 300 MW capacity (Fixed speed turbine) and two reversible Francis turbine each of 150MW (Fixed speed turbine) operating under a rated head of 209.00 m in generating mode and 220.00 m in pumping mode.
- 40 wide and FSD of 5.0 m Tail race channel of 104.66 m long joining with the proposed lower reservoir.

vii. The sailent features of the project are as under: -

Project details:

Name of the Proposal	Kolhapur Off-Stream Closed Loop Pumped Storage Project - Maharashtra

Location (Including coordinates)	The proposed upper reservoir are at longitude 74° 6'5.43"E and latitude is 16° 0'48.32"N and that of lower reservoir are at longitude 74° 7'13.12"E and latitude 16° 0'21.26"N.
Inter- state issue involved	No
Seismic zone	Zone -III (Moderate)

Category details:

Category of the project	1(c) River Valley Projects
Provisions	
Capacity / Cultural command area (CCA)	1200MW
Attracts the General Conditions (Yes/No)	No
Additional information (if any)	Nil

Electricity generation capacity:

Powerhouse Installed Capacity	1200MW
Generation of Electricity Annually	7248 MU
No. of Units	5 Nos. (3 X 300 MW) + (2 X 150 MW)
Additional information (if any)	Nil

ToR/EC Details:

Cost of project	7519.12 Cr.
Total area of Project	390.95 Ha
Height of Dam from River Bed (EL)	UR with rockfill embankment for the weighted average height of around 22 m (with maximum height of 43) m & LR with rockfill embankment for the weighted average height of 36 m (with maximum height of 53m)
Length of Tunnel/Channel	139.29 m
Details of Submergence area	256.77 Ha
Types of Waste and quantity of generation during construction/ Operation	Muck from excavation, solid waste from labour colony and construction waste
E-Flows for the Project	Not Applicable, as this is Off-Stream Closed Loop Pumped Storage Project (PSP)
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin.	No

If not the E-Flows maintain criteria for sustaining river ecosystem.	

Muck Management Details:

No. of proposed disposal area/ (type of land-Forest/Pvt. land)	One Location of 40 Ha in Non-Forest Area
Muck Management Plan	Will be Provided in EIA/EMP report
Monitoring mechanism for Muck Disposal	Will be Provided in EIA/EMP report

Land Area Breakup:

Government land/Forest Land	55.09 Ha-Forest Land
Submergence area/Reservoir area	256.77 Ha-Upper & Lower reservoirs
Land required for project components	390.95 Ha- Total Land requirement
Additional information (if any)	335.86 Ha-Private Land

Presence of Environmentally Sensitive areas in the study area

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/No**	**Detailsof Certificate / letter/ Remarks**
Reserve Forest/Protected Forest Land	--	Nil
National Park	---	
Wildlife Sanctuary	---	

Court case details:

Court Case	Nil
Additional information (if any)	Nil

Affidavit/Undertaking details:

Affidavit/Undertaking	Enclosed
Additional information (if any)	Nil

Previous EC compliance and necessary approvals:

Particulars	**Letter no. and date**
Certified EC compliance report (if applicable)	Not Applicable
Status of Stage- I FC	Yet to Apply
Additional detail (If any)	Nil
Is FRA (2006) done for FC-I	Yet to Apply

Miscellaneous

Particulars	Details
Details of consultant	M/s. R S Envirolink Technologies Pvt. Ltd. (RSET) (NABET Accredited Consultant Organization) Certificate No: NABET/EIA/2225/RA0274 Validity: August 15, 2025

Project Benefits	• Pumped storage power project is a modified use of conventional hydropower technology to store and manage energy or electricity by moving water between an upper and lower reservoir. Currently, pumped storage round-trip or cycle energy efficiencies exceed 80%, comparing favorably to other energy storage technologies and thermal technologies. This effectively shifts, stores, and reuses energy generated until there is corresponding demand for system reserves and variable energy integration. This shifting can also occur to avoid transmission congestion periods, to help more efficiently manage transmission grid, and to avoid potential interruptions to energy supply. This is important because many of the renewable energy resources being developed (e.g., wind and solar) are generated at times of low demand and off-peak energy demand periods are still being met with fossil fuel resources, often at inefficient performance levels that increase the release of greenhouse gas emissions. • Further, pumped storage projects are critical to the national economy and overall energy reliability because it's: o Least expensive source of electricity, not requiring fossil fuel for generation o An emission-free renewable source o Balancing grid for demand driven variations o Balancing generation driven variations o Voltage support and grid stability • Apart from this, proposed PSP will also benefit the local community by creating employment opportunities and will result in upliftment of livelihood and socio-economic conditions.
Status of other statutory clearances	**Forest Clearance:** Online application seeking forest diversion for around 55.09 Ha after receipt of ToR Approval. Alongside, other statutory clearances (as applicable) from State as well as Central government will be obtained post completion of Detailed Project Report.
R&R details	Details shall be evaluated during EIA/EMP Studies
Additional detail (If any)	Nil

viii. Alternate Layouts: Three alternative layouts for this scheme were studied.

Alternative – 1: Layout with Surface Powerhouse and other components of this scheme are Site – 1 Upper reservoir, Approach Channel, Intake structure, Penstock / Pressure Shaft, Tail Race Outlet, Tail Race Channel and Site-1 Lower reservoir.

Alternative – 2: Layout with Surface Powerhouse and other components of this scheme are Site – 1 Upper reservoir, Approach Channel, Intake structure, Penstock / Pressure Shaft, Surge Shaft, Tail Race Outlet, Tail Race Channel and Site – 2 Lower reservoir.

Alternative – 3: Layout with Surface Powerhouse and other components of this scheme are Site – 1 Upper reservoir, Approach Channel, Intake structure, Surge Shaft, Penstock / Pressure Shaft, Tail Race Outlet, Tail Race Channel and Site – 3 Lower reservoir.

Selection of Final Layout

Alternative – 1 layout has been preferred considering the following reasons:

- The length of embankment of lower for Alternative -1 (i.e., 1502 m) is less than Alternative – 2 & 3 (i.e., 2170 m & 2418 m respectively). Hence, considerable cost and time can be reduced for Alternative – 1 layout.
- The length of Penstock for Alternative -1 (i.e., 1250.07 m) is less than Alternative – 2 & 3 (i.e., 1592 m & 2049 m respectively). Hence, considerable cost and time can be reduced for Alternative – 1 layout. In addition, since the length of water conductor system is more and L/H ratio is also more than 6 in Alternative – 2 & 3, Surge shaft structure is required to be provided as an additional structure which will increase overall project cost further considerably in Alternative – 2 & 3 layouts.
- On detailed assessment for Social and environmental aspects it was observed that the lower reservoir area of Alternative - 3 is in thinly populated and cultivated area and few roads are connecting various villages. Keeping the reservoir in this location will cause disturbance and dislocation of populations, social and environmental issues. Whereas in case of Alternative – 1, no social and environmental issues are envisaged.
- The total land area required for Alternative – 1 (i.e., 390.95 Ha) is less than Alternative – 2 & 3 (i.e., 477.28 Ha & 631.44 Ha respectively).
- The forest land area required in Alternative – 1 (i.e., 55.09 Ha) is less than Alternative – 3 layout (i.e., 404.59 Ha).

44.12.3 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of terms of reference to the project for Kolhapur Off-Stream Closed Loop Pumped Storage Project (1200 MW) in an area of 390.95 Ha located at Village Dhamapura, Kanu BK, Tehsil Chandgad, District Kolhapur (Maharashtra) by M/s Rithwik Projects Private Limited.

The project/activity is covered under Category A of item 1 (c) 'River Valley projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.

44.12.4 The EAC after detailed deliberation on the information submitted and as presented during the meeting ***recommended*** for grant of Standard ToR for conducting EIA study for Kolhapur Off-Stream Closed Loop Pumped Storage Project (1200 MW) in an area of 390.95 Ha located at Village Dhamapura, Kanu BK, Tehsil Chandgad, District Kolhapur (Maharashtra) by M/s Rithwik Projects

Private Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

[A] Environmental Management and Biodiversity Conservation:

i. Cumulative Impact of project on carrying capacity and sustainability of Reservoir/ nalahs of catchment area / due to tapping of water for filling reservoir.
ii. Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Standard ToR shall be collected for preparation of EIA/ EMP report along with soil characteristics which shall be studied at minimum 10 locations. The ground water level at 10 locations shall be measured in project area in all three seasons.
iii. A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted for power generation and thermal stratification. Accordingly, Environment Management plan shall be prepared.
iv. Sampling locations be located to cover villages situated near the reservoir and around boundary of forest area for collection of baseline data and data to be incorporated in EIA/ EMP report.
v. Identify the sand mining/ quarrying sites in submergence area and downstream of reservoir.
vi. Source of construction material and its distance from the project site along with detailed transportation plan for construction material.
vii. A detailed reclamation/ restoration plan of quarrying site/sites be incorporated in the EIA/EMP report.
viii. Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is located outside the Eco Sensitive Zone (ESZ).
ix. A detailed wildlife conservation plan for Schedule –I species be prepared duly approved by the Chief Wild Life Warden be submitted.
x. In case any Wildlife Corridor is located within 10 km radius of the project site a detailed study shall be conducted to assess the impact of project on safe movement of wild animals.
xi. Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.
xii. Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Govt. institutions/ Indian Council of Agriculture Research (ICAR)and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.
xiii. MoU for water uses for the project shall be signed and approved by concerned authority.
xiv. Environmental matrix during construction and operational phase needs to be submitted.
xv. Matrix formulated on the basis of detailed study and field survey of flora and Fauna methodology used shall be mentioned in the EIA report.
xvi. Endemic plant and animal species found in the area concerned shall be provided instead listing entire endemic species found in the State.
xvii. Details of Flora and Fauna reported in submergence area, Nos. of tree along with their density and nomenclature of the tree species required to be felled for reservoir creation and other project component.
xviii. Project impact on avi-fauna shall be studied and incorporated in EIA/ EMP report.
xix. Impact assessment on the fish diversity based on the hydrological alteration at the water drawing sources shall be studied.
xx. Stage-I Forest Clearance shall be obtained.
xxi. Study of impacts of project on water sources i.e. Ghatprabha River.

[B] Socio-economic Study

xxii. Declaration by the project proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.

xxiii. All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/ EMP report in the relevant chapter.

xxiv. Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F.No.22- 65/2017- IA.III dated 30th September, 2020 shall be submitted.

xxv. Tentative no. of project affected families shall be identified and accordingly appropriate Rehabilitation & Resettlement plan shall be prepared.

xxvi. Details of settlement in 10 km area shall be submitted.

[C] Muck Management/ Disaster Management

xxvii. Details of quantity of muck generation component wise and disposal site along with transportation plan and its monitoring to be provided.

xxviii. Details of Muck Management plan prepared along with estimated cost incorporated in EIA/ EMP report.

xxix. Techno-economic viability of the project must be recommended from CEA/ CWC

[D] Miscellaneous.

xxx. Pre-DPR Chapters viz. Layout Map and Power Potential Studies duly approved by CWC/CEA shall be submitted.

xxxi. Undertaking need to submitted on affidavit that regarding no activities has been yet started on the project site and water allocated to this scheme shall not be diverted to other purpose.

xxxii. Both capital and recurring expenditure under EMP shall be submitted.

xxxiii. The photograph should bear the date, time, latitude & longitude of the monitoring station/ sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyse the samples.

xxxiv. Arial view video of project site shall be recorded and to be submitted.

xxxv. Detailed plan to restore wider roads and convert them into narrow upto 10m after construction of the project.

The meeting ended with vote of thanks to the Chair.

*****

ANNEXURE

ATTENDANCE LIST

Sr. No	Name& Address	Role	Attendance
1.	**Dr. K. Gopakumar**	**Chairman**	P
2.	Dr. N. Lakshman	Member	P
3.	Dr. Mukesh Sharma	Member	P
4.	Dr. A. K. Malhotra	Member	P
5.	Dr. Uday Kumar R.Y.	Member	P
6.	Shri Sharvan Kumar	Member (Representative of CEA)	P
7.	Shri Ashok Kumar Kharya	Representative of CWC	P
8.	Dr. A. K. Sahoo	Representative of CIFRI	P
9.	Shri Yogendra Pal Singh	Member Secretary	P

APPROVAL OF THE CHAIRMAN

Fwd: Draft MOM of the 44th EAC meeting held on 27th -28th March 2023-reg. Inbox ×

Yogendra Pal Singh via nic.in
to me

2:30 PM (1 hour ago)

From: kgopa@iisc.ac.in
To: "Yogendra Pal Singh" <yogendra78@nic.in>, jaj@wii.gov.in, ajitkumarmalhotra463@gmail.com, "amiya sahoo" <amiya.sahoo@icar.gov.in>, amiya7@gmail.com, "Ashok Kumar Kharya" <ceenvtmgmt@nic.in>, "bijayaketan panigrahi" <bijayaketan.panigrahi@gmail.com>, "chandrahas deshpande" <chandrahas.deshpande@welingkar.org>, dchandrahas@gmail.com, "Ashok Kharya, Chief Engineer" <kharya-cwc@nic.in>, mukesh@iitk.ac.in, lnand@rocketmail.com, "kn shenoy" <kn.shenoy@manipal.edu>, udaykumarry@yahoo.com, "Dr. Vijay Kumar" <vijay.kumar66@nic.in>, "director cifri" <director.cifri@gmail.com>, "director cifri" <director.cifri@icar.gov.in>, "Sharvan Kumar" <krsharvan@nic.in>
Cc: "Saurabh Upadhyay" <saurabh.upadhyay85@gov.in>, "Sourabh Kumar" <sourabh.9@govcontractor.in>
Sent: Wednesday, April 19, 2023 11:10:32 AM
Subject: Re: Draft MOM of the 44th EAC meeting held on 27th -28th March 2023-reg.

Dear Sir
Yes I agree with this
Kindly get the opinions from other experts also before we finally approve it. If you have already obtained the suggestions from other members, then kindly go ahead .
With regards
Gopakumar

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